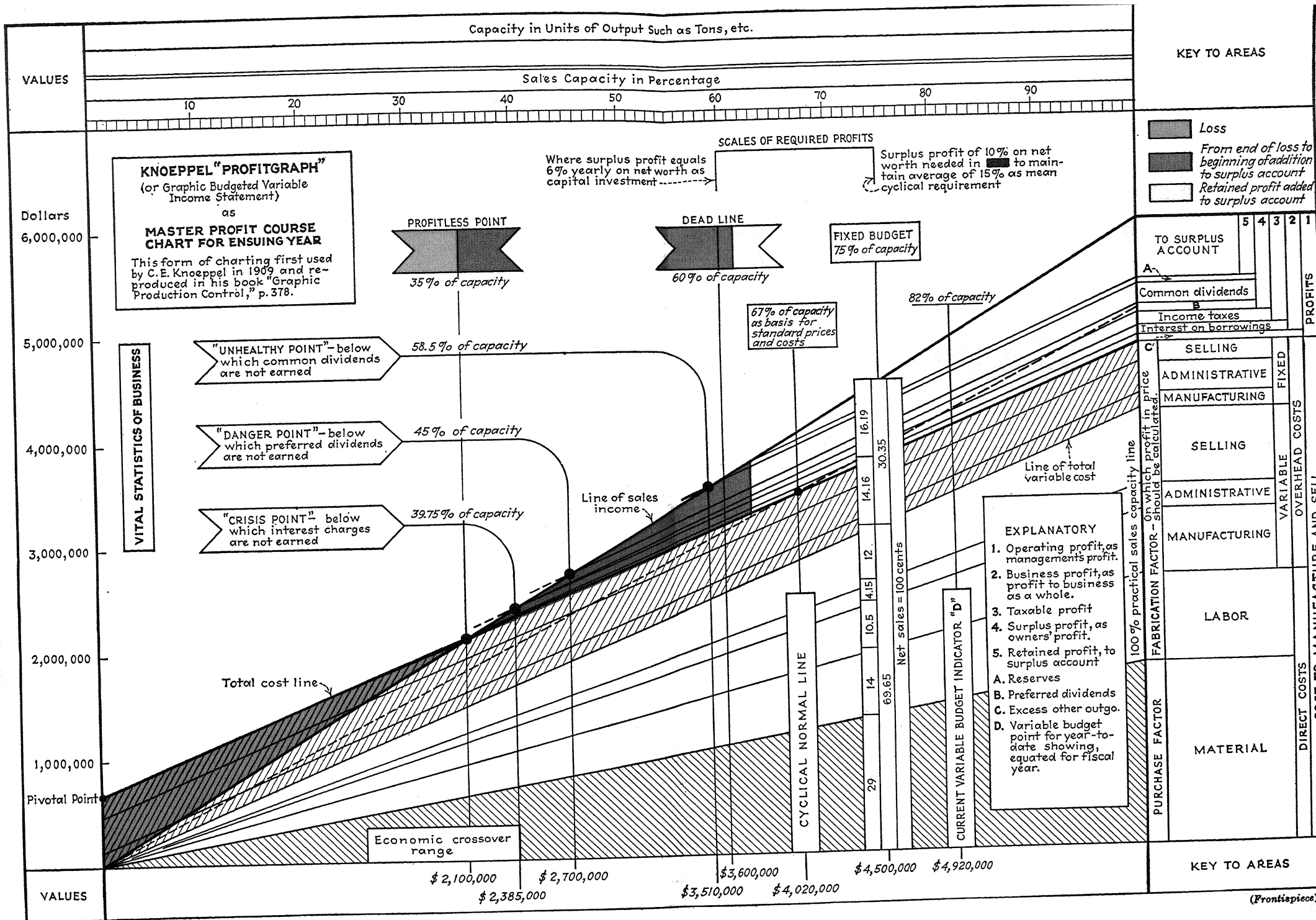


PROFIT ENGINEERING

C. E. KNOEPP

PROFIT ENGINEERING



PROFIT ENGINEERING

*Applied Economics in
Making Business Profitable*

BY

C. E. KNOEPPPEL

Industrial Management Counsellor, Girard Trust Company Building, Philadelphia, Pa.; Member and National Director, Society of Industrial Engineers; Member, National Association of Cost Accountants; Author of Maximum Production in Shop and Foundry, Organization and Administration, Installing Efficiency Methods, Graphic Production Control, Industrial Preparedness

WITH FOREWORD BY

FRED W. SHIBLEY

Vice President, Bankers Trust Company, New York City

AND SUPPLEMENTARY CHAPTERS BY

ARTHUR J. MINOR, B.S., C.E.

Business Consultant, "Mathematics behind the Profitgraph," Lansdowne, Pa.

E. ST. ELMO LEWIS

Sales Counsel, "Securing Sales Called for by Profitgraph," Detroit, Mich.

FIRST EDITION

THIRD IMPRESSION

McGRAW-HILL BOOK COMPANY, INC.

NEW YORK AND LONDON

1933

COPYRIGHT, 1938, BY THE
MCGRAW-HILL BOOK COMPANY, INC.

PRINTED IN THE UNITED STATES OF AMERICA

*All rights reserved. This book, or
parts thereof, may not be reproduced
in any form without permission of
the publishers.*

THE MAPLE PRESS COMPANY, YORK, PA.

FOREWORD

This is a book which outlines a plan of business organization and methods of operation such as to assure a profit as far as is humanly possible under good management. Its purpose is to stimulate constructive thinking on the part of the reader by the graphic presentation of practical ideas relating to the fundamental factors and principles of business organization, management, and control. The author recognizes apparently the ancient truth that knowledge cannot be taught, but must be acquired through the perception of ideas and their exhaustive mental analysis. The subject is an intriguing one, lending itself to philosophic reasoning as well as to hard-headed study. The fact that profit is the basic factor on which the business structure rests is not only emphasized by the author, but is illustrated by him in a chart which he has devised, so realistic and convincing that one is not required to be an economist to understand what "Profit Engineering" means, but is required only to possess a little common sense.

During the past three years which are ending in a turmoil of indecision, we have had a bitter and humiliating experience in profitless business. We have not been able to adjust expenses to income, save only in exceptional instances. It begins to look as if we were in danger of becoming victims of the inferiority complex, which might be termed break-evenism. Red ink has become so familiar in the budgets of nations, corporations, and individuals that a financial statement showing a net profit at the present time would appear an anomaly.

It is evident, therefore, that the time has come for serious thinking along the lines of financial and operating control in industry generally. If we are to continue a nation of

FOREWORD

solvent business people, we must improve our business methods and in particular we must make profits rather than volume our goal.

If labor is to be paid fair wages, a profit must be made on what is produced. If stockholders are to receive dividends on their investments, and if interest is to be earned on funded debts, a profit must claim its rightful and just position in the sales dollar of every business enterprise. Consumer purchasing power will never rise to a level which shall provide work for everybody unless profit lifts it up. Profitless business is a social enemy, a labor tyrant, a destroyer of trade and commerce. Whatever shall assist business to reestablish itself on a profitable basis is a national good.

It is well to bear in mind, in this connection, that as a nation we are not acutely profit-minded. Our primary and dominating instinct is to do things. The profit of the accomplishment is secondary.

If, for example, the cotton textile industry were motivated by profit-mindedness, the evils which now appear to afflict the industry would fade away. Excess production capacity, night and day runs, unemployment, low wages, sales prices below costs, no dividends, declining credit would find no excuse for being when related to an economic structure which demanded profit as a necessity of operation, not a potential necessity, but an absolute one.

It is recognized that prices, of both raw materials and fabricated commodities, have fallen below the level of attainable profits, except in a relatively few industries. This persistent decline in prices, although governed in a major degree by world conditions, was accentuated nevertheless by the craze for volume to offset the decline. Certain people believed that low prices would increase volume, thus maintaining the employment of labor and so reducing overhead costs that a profitable result would ensue. The fallacy of this belief is apparent and we now understand that there exists an economic price level below which prices cannot fall without throwing great masses of labor out of

FOREWORD

employment, reducing income, and seriously contracting purchasing power. Raw material prices are world prices. They were pulled down to their present miserable level by world conditions and it is becoming apparent that they will not rise until world conditions materially improve. The prices of our fabricated products, whose market is largely a domestic one, cannot rise with any assurance of permanency unless they are supported by a relative rise in raw material prices. It is necessary that this fact be recognized and its grim significance properly appreciated. It is of outstanding importance that labor, in particular labor leaders and the instructors of labor, should appreciate the fact that wages are tied inextricably into the price structure and that good wages are dependent wholly upon prices for the products of labor yielding a fair profit.

Industry in this country at the present time must adapt itself to working conditions which are out of balance, with the hope that through so doing acceleration will be given to a restoration of balance. Profit-mindedness on the part of everyone engaged in any department of human industry is accordingly of the utmost importance.

Mr. Knoeppel sums up his philosophy of business in the concluding paragraph of the first chapter of this notable book as follows:

The broad premise of this presentation, then, is that the public does not exist for business, but that business exists for the public; that business is a service mechanism; that service at a profit, not profit alone, is the keystone in the business structure; that profit should be adequate and regular, in the same way that wages and salaries should be continuous and as high as possible; that all costs are costs of distribution; that an economic price is one that is fair to all parties concerned; that profits should be planned in advance and controlled much as is production in our plants; and that it is the province of profit engineering to bring about this desirable and necessary result.

It is a pleasure to endorse so comprehensive and humanistic a philosophy of business.

FRED W. SHIBLEY.

NEW YORK CITY,
January, 1933.

INTRODUCTION

This book is about a matter of vital importance to every business man—his “profits.”

It promises, through a different approach to the problem of profit making and the adoption of a simple practice of planning and control, that x profit dollars now being made can become x plus y profit dollars.

What is presented herein is not a theoretical concept, but tested practice which has been used and is being used by many successful concerns, the managements of which go about their work of profit making on an “assurance” basis.

Behind this work is the author’s professional experience of twenty-eight years (following six years as iron molder, draftsman and office clerk), as a believer in the doctrines of Frederick W. Taylor and Henry L. Gantt, then as a disciple and associate of Harrington Emerson, and finally as a practitioner in business with others and for himself.

In 1909 the Profitgraph (see frontispiece) had its beginning. During 1921 the idea of the “engineering of profits” was born. What led to the present development will be stated briefly, as it has a real bearing on how to increase profits through planning and control.

Nearly twelve years ago, betterment work of a professional nature was begun for a large and well-known industrial concern manufacturing a semi-luxury product and selling in a market overstocked with goods. Initial work had to do with improvements in organization and better methods for controlling production. It was not long, however, before it was discovered that the concern was so sick that an operation was imperative, rather than a regular course of engineering treatment.

INTRODUCTION

A radical change in attack was immediately decided upon and, instead of working from the standpoints of organization and production, the viewpoints became those of sales, finance, and *profits*.

Balance sheets and income statements were carefully reviewed and a ratio analysis prepared. It was found that 50 per cent of the assets were in inventories and 40 per cent of the liabilities were in payables of one kind or another. The ratio of sales to inventory was 0.8 to 1.0; of current assets to current liabilities 1.57 to 1.0; of liquid assets (cash and receivables) to accounts and notes payable 0.6 to 1.0; of sales to capital investment less than 0.6 to 1.0. The business was in "red," and its financial position was becoming steadily worse. As can be seen, the management of this company was flirting with a receivership.

Several remedial steps were taken.

1. "Synthetic" balance sheets and income statements were developed, as they should look six months later, incorporating substantial reductions in inventory and payables, increased sales volume, and a definite profit and loss objective.

2. Analyses were made of sales by products for a period of years.

3. An external market analysis was made.

4. Graphic charts were prepared, covering all important inventory items, so as to observe the extent to which the items were out of balance.

5. Labor force was materially reduced, so as not to pile up work in process faster than goods could be sold.

6. Purchases, expenses, and additions to labor force were put on a rigid budget.

7. A "crossover" or "break-even point" chart (Profitgraph) was prepared to show what the business *had to do* to improve its financial position.

8. Sales-progress charts were made weekly, relating results to pre-determinations, by product lines and territories, as a guide to developing the spirit of the game among the salesmen.

9. Product lines were studied to reduce the number.

10. The entire business was placed on a progressive budget basis, with results shown *graphically*.

At the end of the six months under consideration, the results were

1. Sales volume increased over the quota set.
2. Profit and loss objective exceeded.

INTRODUCTION

3. Inventory reduction anticipated was approximately secured.
4. Payables substantially reduced.
5. Product lines cut practically in half.
6. Goods in process materially speeded up.
7. Labor costs substantially reduced.
8. Better control of business by management.

As important as this work was to this company, as significant as the gains made, they were really incidental to a much more vital result—a result of far-reaching import to industry as a whole—the *conviction, and then the proof, that sales volume and profit margin could be predetermined and planned, and the scheduled anticipations approximately attained.*

Out of this episode an idea was born: an idea that if the production of manufactured goods in our plants could be placed on a plan and control basis, in a definite and regular way—as it had been through the development of an engineering technique—it was, likewise, possible to plan and control sales income and cost outgo so as to result in *profit assurance.*

Over the years since this experience, the author has given more and more attention to financial records, financial relationship analysis, budgeting on the “variable” principle, standard costs, variation accounting, economic policies governing profit making, management’s relation to profit making, mathematics of profit “par,” organizing for profit making, profit-planning and control machinery, as well as to constantly bettering the “business navigation chart” now known as the Knoeppel Profitgraph.

This book, therefore, is the result of the idea mentioned, and of work done in a professional way since that time—a work that is coming to be known in industry as *profit engineering*, which is another way of saying “applied economics in making business profitable.”

To those in industry confronted with the responsibility for, and the task of, securing adequate and regular profits from their businesses, whether chief executives, general managers, sales managers, controllers, accountants, treas-

INTRODUCTION

urers, factory superintendents, foremen, office managers, bankers, and others, this book is respectfully dedicated, with the hope that it will both make their work easier and *better their results*.

C. E. KNOEPPPEL.

PHILADELPHIA,
January, 1933.

ACKNOWLEDGMENTS

A book is never the result of a single man's unaided effort. He may write it as a result of a long experience in the field embraced by the book, yet, as is usually the case, his own contribution is one to which other men have added their bit, by association or otherwise.

It is only fitting, therefore, to acknowledge the help of Edgar G. Seybold, who was associated with the author and in charge of the professional work mentioned in the Introduction and who helped in the subsequent development; of William M. Halbrooks, an associate for several years, who assisted the author in making improvements in the Profitgraph, "variable" budgeting, and financial-ratio analysis; of Carle M. Bigelow, of Bigelow, Kent, Willard & Co., Inc., who enabled the author, as managing director of Waste Eliminators, Inc., to devote the years 1925-1928 not only to waste elimination (a field he was keenly interested in as a result of his participation in the work of the Hoover Committee on the Elimination of Waste in Industry in 1921), but also to a development of methods of "assuring" the making of profits; and of John M. Carmody, who, as editor of *Factory and Industrial Management*, published his series of articles on profit planning and control during the first seven months of 1930, around which articles this book was planned and written.

Particular mention is made of the splendid aid of two men who have written chapters for this book: Arthur J. Minor, who was among the first to see the possibilities in the author's Profitgraph and the practice behind it, from the standpoint of both their promotional value and their economic importance in actual use in industry, and who, relying on research of his own, has written the chapter "Mathematics behind the Profitgraph," covering some of

ACKNOWLEDGMENTS

the refinements he has made; and E. St. Elmo Lewis, who, due to an unusual ability to “see things whole” from the angle of sales at a profit—to look upon selling from its “staff” rather than “line” side, and to think quantitatively about sales matters—has been among the few sales executives to view the author’s practice in its true light, from all of which has come the chapter “Securing Sales Called for by Profitgraph.”

The author also wishes to voice his appreciation of another kind of contribution—that of Fred W. Shibley, for the constant inspiration of his book “The New Way to Net Profits” as well as for his friendly interest in the author’s effort to place a technique of profit planning and control before the business world.

CONTENTS

	PAGE
FOREWORD, BY FRED W. SHIBLEY	v
INTRODUCTION	ix
ACKNOWLEDGMENTS.	xiii
CHAPTER I	
BUSINESS AND PROFITS.	1
CHAPTER II	
LOSSES AND THEIR REASONS	14
CHAPTER III	
IMPORTANCE OF FINANCIAL RECORDS IN PROFIT MAKING. .	28
CHAPTER IV	
THE USE OF GRAPHICS IN PROFIT MAKING.	47
CHAPTER V	
PROFIT PLANNING ANALOGOUS TO PRODUCTION PLANNING .	51
CHAPTER VI	
CALCULATING THE PROFIT REQUIREMENTS	65
CHAPTER VII	
THE PROFITGRAPH AS A "VARIABLE INCOME STATEMENT" .	79
CHAPTER VIII	
THE PROFITGRAPH AS A NEW MANAGEMENT "TOOL" . . .	96
CHAPTER IX	
BUDGETING FOR "REQUIRED" PROFITS.	112
CHAPTER X	
PREDETERMINING AND BUDGETING "ALLOWABLE" COSTS. .	131
CHAPTER XI	
CONTROLLING "ALLOWABLE" COSTS.	147

CONTENTS

	PAGE
CHAPTER XII	
CONTROLLING TO "ASSURE" PROFITS	161
CHAPTER XIII	
WATCHING THE DOLLARS AT WORK	180
CHAPTER XIV	
ECONOMIC FACTORS GOVERNING PROFIT MAKING	194
CHAPTER XV	
MATHEMATICS BEHIND THE PROFITGRAPH, BY ARTHUR J. MINOR.	210
CHAPTER XVI	
SECURING SALES CALLED FOR BY PROFITGRAPH, BY E. ST. ELMO LEWIS	231
CHAPTER XVII	
ORGANIZING A BUSINESS FOR PROFIT MAKING.	253
CHAPTER XVIII	
THE MODERN CONTROLLERSHIP IN BUSINESS	267
CHAPTER XIX	
GREATER PROFITS THROUGH TAPPING HUMAN POWERS . .	280
CHAPTER XX	
MANAGEMENT AS THE KEYSTONE IN PROFIT MAKING . . .	291
CHAPTER XXI	
PROFIT ENGINEERING	302
INDEX.	317

CHAPTER I

BUSINESS AND PROFITS

Industry should be profitable. I have no sympathy with indictments of profits. They are the motive power of our economic system and why deny it or apologize for it?

I know of no way concerns can make profits unless they render service, and conversely, if they do not make profits, they cannot render service.

Why is it that a concern that does not render service enough to make profits is permitted to use our labor, of which we have not too great a supply, or our capital, which is always difficult to get, for an unprofitable use to society?—OWEN D. YOUNG—newspaper dispatch, June, 1926.

To appraise and understand business and profits adequately, not only as we know them today but with reference to our many pressing problems of tomorrow, it is necessary mentally to go back to beginnings and, in bird's-eye-view fashion, review their evolution.

To do this, let us, in our imagination, become the original men of the race. We find ourselves almost overpowered by something which we cannot describe or explain but which forces us to grab at growing things and to kill birds and animals, which we tear at with our teeth and swallow in great gulps. We were hungry, and instinct came to our rescue by showing us how to satisfy that hunger. To dodge the destructive forms of life and to get away from the storms and the chill of the night air, we climb into trees and hide in caves. To keep warm, avoid the bites of insects, and guard against flesh cuts, we fashion rude coverings for our bodies and sandals for our feet.

For our mutual protection we band together in small groups and roam from place to place, always seeking water, food, shelter, and the means wherewith to clothe ourselves.

Our small groups become larger and larger, finally becoming communities, the work of which is mostly that of hunting, fishing, making huts and bodily coverings. Later, we learn that by growing certain things we can make the basis of foodstuffs (*the beginnings of agriculture*).

In our march of progress we become proficient at different things. One weaves better cloth than the others. Another makes better coverings for the feet. Still another forges the best weapons. We begin to exchange the things each can do best for the things others are more proficient at. What each tries to do is to anticipate the others' needs and wants (*the beginnings of market research*) by making and holding quantities of the things we are skillful at fashioning, and which others cannot make so easily or so well (*the beginnings of manufacturing*).

Behind all of this was one thing—mutual helpfulness, or *service*. If someone could make a better shirt in shorter time than I could, he rendered me real aid in making some shirts for me, for which I was willing to “pay” him (trade for the shirts) out of the “store” of things I could make best that he needed or wanted. Out of this came what we know as the “division of labor” and “merchandising.”

As this “bartering” grew among us, there arose the necessity for some means whereby X hogs would equal Y bushels of wheat, and A pairs of shoes would be equivalent to B feet of lumber. We needed a trading measuring stick and therefore we used things of intrinsic value (or representing intrinsic value) as a medium of exchange whereby one kind and quantity of goods could be sold for another kind and quantity of goods. This we know today as money.

As this making and trading process grew, with money or its equivalent as the medium for trading, risks and uncertainties were confronted, losses were at times sustained, goods were stolen or destroyed, goods representing work had to be made and carried against future demand, and occasional idleness had to be put up with. An element was necessary to offset these things. Otherwise there would have been no reward for service and the “incentive” for

BUSINESS AND PROFITS

endeavor would have been destroyed. It was thus that the idea of "profit" was born—profit as a service charge.

Thus viewed, mutual helpfulness, or service, became the keystone of what we know today as "business," with "profit" as a form of protection, reward, and incentive. I am not unmindful of the adulteration of this concept through what has happened down the ages, in the form of sharp practice, trickery, crookedness, driving hard bargains, and the like. In too many cases in which profit is expected, service is far from being what it should be, and it is not always true that the highest type of service is properly rewarded.

PROFITABLE SERVICE

At any rate, as one reviews the above statements, it becomes apparent that the factors—service and profits—are so tied together as to give us but one conception—profitable service. Or, to put it another way, if there is no service, there should be no profits. Still another way of saying the same thing is that, if there is a service rendered, there should be no losses.

Let me illustrate. You can make a modern radio for your home, but it would cost you much more to make than what you can buy one for, would take you much longer to build, look less attractive, and work less effectively. Not wanting to spend money unnecessarily, nor desiring to waste your time, and being unwilling to have a radio that is both unattractive and ineffective, you prefer to purchase one. In other words, you are willing to buy the radio from those who have become proficient in its manufacture and sale, and who can give you low cost, immediate delivery, attractive design, and effectiveness of operation. They are rendering you a service in providing you with something which you cannot—factor for factor—provide for yourself. For this service you are willing to pay something over and above the costs expended by these specialists. You are willing to do this for several reasons:

1. As a reward to them for their superior ability and expert knowledge of the factors involved.

PROFIT ENGINEERING

2. As an incentive to make every effort to give you the latest and best in design and workmanship.

3. It was because of profits from other people that they were able, through research and development work, to give you the equipment you bought.

4. Out of the "extra" you paid them, they can make better radios for future users and thus develop the art.

5. This "extra" represents but a fraction of what it would have cost you to make a radio equally good.

6. You have saved and they have gained; mutually both have profited.

Profit (excess of returns or income over expenditure in a given transaction, business, or the like; accession of good, valuable results, benefit, gain), as a "service charge," is the increment over investment (or outgo) as protection, reward and incentive, covering research, knowledge, experience, skill, effort, betting on a vision, taking the chances involved, and the like, in the great and vitally necessary work of *serving others*.

Thus we see that modern business, in the last analysis, is the machinery which has been built, as a result of our progress down the ages, to supply the needs and wants of mankind. This is the only excuse for its existence. Its only function, its real mission, is to help and benefit the race by "exchanging" goods and services that one man or group can make or render better for those of another man or group, to the end that we may be better off this year than last, and even better next year than this. Only in this way are standards of living raised; and a race progresses as standards of living become higher and higher.

But—and keep this clearly in mind—it is only out of "prior" profits that we are able to *currently* serve each other, and it is only out of "current" profits that we can better serve in the *future*.

It can be seen, then, that if we attempt to exact large profits and slight the service factor or expect service of an unusual nature without paying a proper profit reward, the only result can be an uneconomic situation in which the greatest good to the greatest number is sacrificed for purely selfish reasons, which is decidedly against public interest.

BUSINESS AND PROFITS

There must be service at a profit! The profit must be in keeping with the service rendered!

PROFITS! WHAT ARE THEY? HOW ARE THEY
SECURED? WHO MAKES THEM? WHO PAYS
THEM?

Let us turn the searchlight on this matter of profits for a few moments, in an effort better to comprehend the real meanings behind the term. Regarding what they are, profits constitute:

1. Reward for skill, ability, experience, and knowledge.
2. Incentive for effort and endeavor.
3. Payment to capital as wages for its use.
4. Protection against chances which must be taken.
5. Provision for research and experimentation.
6. Insurance against losses which are entirely unforeseen.
7. Assurance of business success and perpetuation.

With reference to how profits are secured, it may be said that a firm makes a profit through having an advantage—or a series of advantages—when compared with other firms in the same or other lines of activity, as for instance

1. Patents—as in the case of International Business Machines, Burroughs Adding Machine, National Cash Register.
2. Control of raw materials—as in the case of the Mather interests covering iron ore, and the Aluminum Company of America.
3. Superior advertising—as in the case of the American Tobacco Company (Lucky Strike cigarettes).
4. Efficient sales management—as in the case of Firestone and Seiberling Rubber in 1931.
5. Monopoly—as in the case of American Telephone and Telegraph Company and the Eastman Kodak Company.
6. Price—as in the case of Hershey Chocolate, Coca-Cola, and General Foods.
7. Administrative control—as in the case of General Motors.
8. Production methods—as in the case of Ford Motor Company.
9. Consolidation—as in the case of the Standard Oil Company.
10. Financial strength—as in the case of United States Steel Corporation.
11. Quality—as in the case of Procter & Gamble Company.
12. Research—as in the case of A. O. Smith Corporation, Milwaukee.

In answering the question, Who makes profits? it is obvious that, if there were no humans to man an industrial enterprise, no profits could be made from mere materials or machines or buildings or methods or money. In other words, human beings, and not inanimate things, make our profits—when they are made. It is human ingenuity in concept and skill in the execution of a concept (the real meaning of the word “engineering”) which are responsible for the profitable conduct of a business enterprise.

To illustrate: A Japanese once noticed how slowly and lazily oysters manufactured pearls; so he asked himself this question: “How can I ‘stimulate’ them to make pearls faster?” That was thirty years ago. Today, this Japanese, K. Mikimoto, is the pearl king of Japan. He takes a bit of tissue from a living oyster, attaches it to a tiny seed pearl, inserts it into another living oyster, and returns it to the sea. Mikimoto has over forty thousand acres of pearl farms in the sea, employs a thousand people, and stimulates three million oysters each year. He is the head of the new culture-pearl industry.

Looking at it broadly, therefore, we can say that no member of a given personnel—whether in shop or office or on the road—is without a definite relation to the work of making profits in a business.

Regarding the question, Who pays the profits? altogether too little consideration is given to an attempt to answer it. If this were not so, merchandising would be on a vastly different plane in business from what it is today.

Let me present what I mean in this manner. In this exchanging process called business, workers and executives, as well as those who control capital, collaborate in this rendering of service. As profit is a service charge, it is something that is not *made* by any one or all of the parties named. It is given or *contributed* by those for whom the service is rendered. It is paid by the users of the products exchanged for value, as a reward for and incentive to those who do the serving.

BUSINESS AND PROFITS

The profit you paid in the case of the radio mentioned was your contribution to the specialists making it for the facilities which they were able to place at your disposal which you could not produce yourself. It should be kept clearly in mind, however, that they "earn" it only because *you* are willing to give it. *It is you—the buyer—who pays the profit.*

ALL IS DISTRIBUTION IN BUSINESS

When business and profits are looked at from these angles, it is clear that business, in the last analysis, is distribution of goods and services to that body of people known as the "public." As Henry Ford puts it, business is the "organization of supply." This will be apparent when we realize that we would not all rush in to manufacture cigars or pins or radios or battleships without some idea as to markets either actual or potential.

Everything that we do in business is with final reference to consumption. Engineering is for sales; purchasing is for sales; personnel work is with reference to sales; so is financing and administration and manufacturing. In the past, altogether too much emphasis has been given to production. The new viewpoint is that, inasmuch as we produce in order to distribute, it is of the utmost importance to consider those whom we are to supply with goods and services. *The consumer, in other words, is the keystone in the business arch.* Since business is distribution in essence, it follows that all outlay, investment, or costs—including profit charges—are *distribution expenditures.*

THE CONSUMPTION MOTIVE

It is generally considered that business is made up of two classes—capital and labor. It is true that there is another and important element—management—but management may be labor (on a salaried basis only) or capital (owning part of the business and taking no salary) or both (owning part of the business and taking salary also). The rewards to labor are in the form of wages to those on both a salary

PROFIT ENGINEERING

and an hourly basis. The rewards to capital—capital's *wages*—are in the form of profits, as interest, dividends, and surplus.

As labor wages make for purchasing power, it follows that the higher they are for given unit costs the greater their purchasing power becomes, and the better the entire economic structure. Does not the same logic apply to the matter of the wages of capital? If there is any power in the argument that hourly and salaried workers require adequate and regular income both as a reward for efficient effort and to raise purchasing power, there is the same strength to the contention that there must be adequate and regular profits in business.

Consequently, along with the "wage motive" we must consider the "profit motive," the combination becoming the purchasing power or "consumption motive," which can be phrased in these words:

Consumption of goods that there may be sales—that there may be profits for capital and wages for workers and executives with which all may buy things—that there may be greater production efficiency through increased mechanization out of which can come reduced prices—thus making for increased purchasing power which stimulates demand—thus completing the cycle.

As will be seen, this consumption motive is not at all at variance with the premises set down covering business and profits.

A SOUND PROFIT POLICY

As long, therefore, as we continue to operate as a capitalistic society, there should be a well-defined profit policy, and I know of no better statement of one than that of the General Motors profit policy, as presented by its vice president, Donaldson Brown, before the American Management Association:

Since business owes its existence to its owners, it is expected to operate for their benefit. This is not inconsistent with the broader ideals of service to the public, because it is only through service to the public that profits to the owners can be assured permanently. Thus,

BUSINESS AND PROFITS

there is just one central motive of industrial management, *i.e.*, the permanent welfare of the owners.

Service is expressed in the form of sales, with profit as the charge for the service. Obviously, the greater the service, the greater should be the profit. Hence, you can see why the issue of *profitable sales* is the greatest one before the business world today.

THE PRICE FACTOR

In these considerations of service at a profit or profitable distribution of goods and services, one factor stands out as overshadowing all others, if our premises so far have been sound and economic. This factor is that of *price*! Regarding this matter of price, which represents mutual agreement in the trading process, and in which profit is an important ingredient, a noted Englishman, Sir Johnstone Wallace, said, "The great need of the business world is a sound price, which bears direct relationship to economic facts. It is the discovery of that price which constitutes our biggest problem."

By the phrase "sound price which bears direct relationship to economic facts," he means an economic price, a price which "returns" the outlay in rendering service of whatever kind plus the service charge called profit. He means, in other words, a "right" price. A right price is one that is fair to buyers, that defrays the outgo costs, and that leaves a proper margin.

Service is not service at all if waste, extravagance, neglect, inexperience, incompetence, and other negatives are present in the price charged for goods and services. One is willing to pay a proper profit on outlay for a service that he requires, plus the outlay itself, but it is uneconomic to ask him to pay his money, which represents his exchange of something for an equivalent, for the other fellow's shortcomings, *plus a reward in addition for his being inefficient*. He thus becomes the "economic goat."

If prices are high, they are so because of inefficiency or excessively large profits, or both, all of which violate the

PROFIT ENGINEERING

demands of the service objective of business. If, however, prices are consistent with the law of "service at adequate and regular profits," because of efficiency, research, development, and constant progress, then we approach the economic objective—a condition in which prices are approximately at standard, which induces demand for a supply of goods. *A right price is the efficient price.*

BUSINESS IS INCOME AND OUTGO

Because the sum of all prices in a given situation makes the income from sales, and because all costs (including profit charges) are costs of distribution, it follows that business, in the last analysis, is merely income and outgo, the one equaling the other. We are not mentioning losses. Profit being the increment which buyers are willing to pay for service, as in the case of the radio previously mentioned, *there should, theoretically, be no losses*, as to sustain them clearly indicates violations of economic laws.

The thought in mind can be visualized as follows:

Each dollar of <i>income</i> from sales should be divided as <i>outgo</i> among the following.....	1. Direct labor costs
	2. Direct material costs
	3. Capital costs through depreciation charges
	4. Adequate maintenance and power charges
	5. Research and waste elimination costs
	6. Manufacturing expenses
	7. Administration expenses
	8. Selling expenses
	9. Shipping expenses
	10. Provision for contingencies
	11. Extraordinary repairs or replacements
	12. Interest charges for credit capital
	13. Dividends for preferred stockholders
	14. Dividends for common stockholders
	15. Additions to surplus account both to protect and to perpetuate business

In this process of division there should be neither more nor less than 100 cents in the outgo, which, in an efficient business, would be a budgeted outgo and would provide for every factor requiring its share of the outgo dollar.

Nor should it be inferred that the outgo items have been arranged in order of importance with labor first and surplus

BUSINESS AND PROFITS

last. Each item in the list is as important, relatively, as any of the others. It is just as necessary to provide for contingencies as it is to pay salesmen for securing orders; just as important to maintain property in a clean, orderly, and efficient way as to pay the interest charges on borrowings. This means, in other words, that profits must be viewed from entirely different angles.

PLANNING AND CONTROLLING PROFIT MAKING

It may be argued that this is all very well in theory, that it is a splendid philosophy but is something which cannot be practiced under conditions as they exist in business at present. As an answer to this viewpoint, let me say that Gen. Coleman T. du Pont wrote me some years ago that the United States Steel Corporation was no harder to run than a peanut stand, if it had good organization, including both the administrative function (staff) and the executive function (line). In this he is supported by Fred W. Shibley, vice president, Bankers Trust Company, New York, who, in an article in the March, 1929, issue of *Nation's Business* chose as his title, "It's Easy to Make Business Pay."

If these men are right in their contentions, and the author's experience leads him to agree with them, then the question becomes, "What is necessary to start the work of making this economic dream come true?"

If we are correct regarding our assumptions as to profits, then it follows that they are vital and necessary to a business, just as blood is vital and necessary to the life of a human being. As Owen D. Young puts it, "They are the motive power of our economic system." Profits, being vital and necessary if business is to render the service it should, should never be left to accident, hope, and blind chance. They should be planned on in advance and so controlled, *all of the time*, as to assure that they will be made. In other words, profit should be the first deduction from the dollar of income, *and the business should be budgeted to operate on the balance.*

PROFIT ENGINEERING

PROFIT ENGINEERING

There are two forces at work which call for this work of planning and controlling our profit making.

In the first place, we have passed through several definite eras that can be classed as machine effectiveness, manpower effectiveness, production-management effectiveness, distribution-management effectiveness (the one we are now in), with the one just ahead of us being that of increasing the effectiveness of credit and invested capital. The dollar must be worked harder and turned over more often than ever before in its long history.

In the second place, there has been a twofold evolution at work in business. There has been the evolution of production control upward, from foremen doing their own planning, to our modern production-control departments, in charge of able supervisors. At the same time there has been an evolution downward, from the old type of treasurerships, to our modern financial-control departments, in charge of able controllers.

The next step in "making the dollar work harder" is the merging of these two types of control into one of "supercontrol," in charge of a major executive. This type of control will link distribution to production and finance, for its viewpoint will be from market studies through to goods on the shipping platform and stock-room shelves. This type of control will consider not only the business in question but the industry of which it is a part, and industry, commerce, and finance as a whole.

The one directing this great work will in reality be a "supercontroller," although his title may be whatever you choose to call it. He will be the "left hand" of the chief executive and will work in a staff capacity. The general manager will be the "right hand" and work in a line capacity.

The department this man will be in charge of will be known as the *profit department*, for its work will be to so plan and control as to make the business successful in the economic sense—making adequate and regular profits.

BUSINESS AND PROFITS

The great work of this department will be *profit engineering*. The one in charge will be the profit engineer.

CONCLUSION

The broad premise of this presentation, then, is that the public does not exist for business, but that business exists for the public; that business is a service mechanism; that service at a profit, not profit alone, is the keystone in the business structure; that profits should be adequate and regular, in the same way that wages and salaries should be continuous and as high as possible; that all costs are costs of distribution; that an economic price is one that is fair to all parties concerned; that outgo should equal income in which there is a fair profit; that profits should be planned in advance and controlled much as is production in our plants; and that it is the province of profit engineering to bring about this desirable and necessary result.

CHAPTER II

LOSSES AND THEIR REASONS

However well we may be able to turn out needles and cars and candlesticks our record for profits is sad. The stockholder is seated at a table covered with glistening linen, set with glittering silver and gleaming china but a mocking host offers him phantom portions without substance or sustenance.—JOSEPH STAGG LAWRENCE, in *Nation's Business*, March, 1930.

One of the dread maladies of business is what the author calls "marginitis," which is the tendency for profits to shrink, become less and less, and disappear altogether. As in the case of that disease so prominently mentioned by a well-known tooth-paste concern, "four out of five have it," for, considered as a whole and with reference to normal times, only 20 per cent of our firms make what can be called *adequate* profits, 40 per cent make small profits, and 40 per cent make losses. In 1927, 45 per cent of the firms filing income-tax returns reported deficits aggregating \$2,471,000,000.

The record of 1,302 concerns in manufacturing and trading industries, 1929 to 1931 inclusive (according to bulletin, National City Company), looks like this:

NET INCOME		
1929	1930	1931
\$3,523,800,000	\$1,936,635,000	\$718,066,000
RATE OF NET INCOME TO NET WORTH		
13.5%	6.7%	2.5%

As profits are desirable, necessary, and vital to the success of industry, then losses are contrary to public interest and uneconomic. If uneconomic, they are a form of waste. As

LOSSES AND THEIR REASONS

waste, we should deal with losses as we would with any other form of industrial inefficiency—through research leading to the elimination of the causes which are responsible for it.

There are many reasons for this “pernicious profit anemia” in business, but the following cover the more serious ones:

1. Lack of standard practice as to profit making, and of vital statistics covering performance.
2. Failure to plan in advance for profits.
3. Acceptance of the fallacy that volume of sales is the cure for losses.
4. Ignorance of actual and potential markets.
5. Neglect to recognize that merchandising is as important as manufacturing.
6. Neglect to study into the “sources” of profit and loss.
7. Lack of efficient profit control.
8. Failure properly to organize a business for making adequate profits.
9. Lack of adequate financial records.
10. Unwillingness of management to shoulder the full responsibility for profit making.

These will be considered under their respective headings.

I. LACK OF STANDARD PRACTICE AS TO PROFIT-MAKING AND OF VITAL STATISTICS COVERING PERFORMANCE

From the author's experience of many years in serving business enterprises, the charge can safely be made that industry lacks definite standards as to profit making and is without adequate facts covering performance in this important field. Serious as the charge may seem to be, the fact remains that, in most of the cases observed, the making of profits is more or less accidental rather than deliberately intentional.

Two words which are generally abused are “profit” and “capital.” To one concern, these words mean one thing; to another, they mean something entirely different. If one speaks of “net profits,” the question immediately arises—“net after what?” When “capital” is mentioned, one wonders whether it means original capital, working capital,

net worth, invested capital, capitalization, operating capital employed in the business, or the total of the assets less the depreciation reserves.

Two other words are played with until they are so meaningless that experts are required to interpret them correctly. These words are "depreciation" and "obsolescence." Since they influence so vitally the capital and profit accounts, what is one to say of the negligence which permits such confusion to exist? The word "inventory" is still another which "Amos an' Andy" would use to describe a "mess" in many concerns. Again, the matter of "base" or denominator on which to calculate profits has a wide latitude as to meaning. In designating profit as a certain percentage of something, do we mean percentage on cost or sales income (gross or net), or on net worth, or on capitalization, or on the total capital employed in the business?

When we come to the matter of what is a fair profit return to a business, and for what time (one year, three years, five years), one man's guess is as good as another's. In the author's experience, it has ranged all the way from 6 per cent (as interest on investment) to 30 per cent, for from one year all the way to an average yearly for five years.

Regarding vital statistics, the author has yet to find a single concern, in his experience of twenty-eight years in professional practice, that could answer any six of the following twelve questions. Where in the business is:

1. The "break-even" point (where losses cease and profits begin)?
2. The point below which interest on borrowed money is not earned?
3. The point below which preferred dividends are not earned?
4. The point below which common dividends are not earned?
5. The point where profits on sales equal 6 per cent on the capital investment?
6. The standard range for "required" earnings?
7. The point of normal capacity over three to five years?
8. The budget point?
9. The point of a 1 to 1 turnover of capital to sales?
10. The point of a 1 to 1 ratio of addition to surplus account to dividends paid?

LOSSES AND THEIR REASONS

11. The point of 100 per cent practical sales capacity?
12. The point of 100 per cent theoretical sales capacity?

Are these questions irrelevant, unanswerable, and without direct reference to the matter of making profits? If there are no standards with reference to these vital points, what are results to be measured against?

Lacking adequate meanings covering fundamental terms, not having essential standards of a quantitative nature covering the pertinent facts regarding the profit side of a business, and not being organized to compile the true results constituting management's performance, most firms are like a ship at sea without chart, compass, or sounding devices, with the result that they are at the mercy of adverse trade winds and economic storms.

II. FAILURE TO PLAN IN ADVANCE FOR PROFITS

Profit making with most firms is an "after the fact" affair. They wait until the end of the year, take an inventory, make the necessary adjustments, and start in on an annual statement which, when it is completed, will show what the profits or losses have actually been. Prior to this, profits or losses have been estimated (guessed at) or generally presented in the monthly records and subject to the yearly adjustments.

Rarely is it that a concern deliberately and scientifically plans its profit making in advance and then works the plan.

Is it any wonder that profit showings, even in good years, are generally so adverse in so many instances? Why should it be considered so strange that profits are small or conspicuous by their absence, when so little predetermination and planning are given to this most vital factor in business success? With due apologies to many efficient controller-ships, where, in our industrial concerns, is there the kind of department directly concerned with profit making, as scientifically conceived, as well organized, and as smoothly and efficiently operated as our modern production-control departments in our plants, without which our much talked

of mass production would be quite impossible? *Is planning for profits less important than planning for production?*

A new building, a new machine, the installing of a power plant, or the launching of an advertising campaign are carefully planned in advance, and the work to be done is carried out in accordance with the plans made. Should it not be the same when it comes to profit making? Profit planning is one of the cures for "marginitis."

III. ACCEPTANCE OF THE FALLACY THAT VOLUME OF SALES IS THE CURE FOR LOSSES

Business has not learned that mere volume of goods produced and sold is not the answer to the question of costs and profits. Size is not a substitute for efficiency, nor will quantity considerations, alone, offset the effects of ineffective management. Despite these axioms of good business, the country has been "volume crazy," which resulted in a rush into, or a serious consideration of, mergers. This nation is a rapidly growing one, with the demands of its population on the increase, yet it is not growing so fast nor the demand increasing so rapidly as the desires of and efforts by industrial executives for more and still more volume and larger and still larger plant units. As one executive said once to the author, "Give me sales volume and our profits will take care of themselves."

The consequence has been overexpansion, overequipment, uneconomic mergers (some of which will have to be "unscrambled"), high-pressure salesmanship, an unusual degree of installment buying, cutthroat competition, enormous advertising expenditures (some of them for advertising decidedly questionable), and a feverish activity to dispose of goods made by a producing machinery nearly twice too large for legitimate normal demands, with all the inefficiency and waste which follow in their trail. The trap which so many fall into is a disbelief in the theory of "greater profits at present or *less* volume."

Somewhere up the capacity scale of a business is a point which can be called that of "economic volume." Beyond

LOSSES AND THEIR REASONS

this point the "law of diminishing return" begins to operate. Below it the "law of increasing costs" puts in its appearance. How many concerns have "researched" to find out where this point is?

IV. IGNORANCE OF ACTUAL AND POTENTIAL MARKETS

Because there can be no profits if there are no sales, and no sales if there are no buyers, it should need little argument to establish the vital importance of knowing all about markets—both actual and potential.

The author is not discounting the value of product research in the slightest, but why do some concerns persist in bringing out new lines or making over old ones without *first* determining the "what," the "how many," and the "how much" with reference to buyers. *Products are useless without buyers.*

In this connection, we recall the case of a large watch company, one of the pioneers in its field. Previous to the making of a market survey, this firm was prone to pin medals on its own chest because of its claimed leadership in its field. Imagine the amazement and chagrin when it was discovered that, when rated with three others, it was fourth in the list. Another firm in the electrical-equipment industry was about to discontinue sales effort in the South. When it had made a study of "potential" sales by territories, it was surprised to find that this neglected section ranked among the leaders from the standpoint of sales possibilities. A manufacturer of prepared roofing decided to adopt some rather direct tactics in selling. It sent men into one section of the country, had them get a list of home owners, sent them around to look over the roofs and determine kind and condition, and then, armed with the facts, was in a position to plan and execute definite sales approaches. A large Pennsylvania concern, manufacturing coal-mining equipment among other things, decided there was little use to advertise or spend much in selling effort, because times were bad and the coal companies were spending little money in new equipments.

PROFIT ENGINEERING

Under its very nose, a German firm came to this country with a process for filling the spaces from which coal had been mined in the anthracite field, so that the pillars could be mined and, up to the time this incident was recited to the author, had sold \$300,000 worth of its equipment.

There is probably no greater field in selling today than that which will be uncovered by market research. It is a sure cure for "business egomania."

V. NEGLECT TO RECOGNIZE THAT MERCHANDISING IS AS IMPORTANT AS MANUFACTURING

We once studied the affairs of a concern making a well-known electrical appliance for use in homes. It manufactured a good product with "buyer appeal," and at low cost. Its manufacturing efficiency was high indeed.

Because costs of administration and selling were relatively much higher than costs of manufacturing, it would be natural to expect that there would be greater efficiency in merchandising. The reverse was the case, as will be seen from this illustration.

This firm spent 8.36 per cent of the sales income in advertising and, instead of using a high-powered rifle and shooting at definite targets, it used a shot-gun and scattered buckshot in all directions in the hope that some buyers would be hit somehow. Out of \$245,086 spent in advertising in one year, this was the division, arranged in order of decreasing amounts:

National newspapers.....	\$ 61,000
Radio.....	43,000
Circulars..	38,000
Trade paper..	23,000
Conventions and display.....	16,000
Direct mail.....	11,000
House organ.....	10,000
Local newspaper.....	10,000
Window display.....	8,000
Airplane.....	6,000
Prizes.....	5,000
Special campaigns.....	2,000

LOSSES AND THEIR REASONS

Moving picture.....	2,000
Periodicals.....	500
Total.....	\$235,500
Balance to adjust to total.....	9,586
Grand total.....	\$245,086

In another case—that of a pioneer concern which once made a nationally known product—it was found that the reason it had “gone to seed” was that it practically ignored merchandising, strange as this claim will appear to be. That this was so, however, will be seen from the statement that for a previous year it had spent \$300 in sales traveling, and nothing at all for advertising. Its management still believed in the bedtime story about that “mouse trap” and the “path to your door.”

VI. NEGLECT TO STUDY INTO SOURCES OF PROFIT AND LOSS

Still another great weakness of business is the failure to study into the sources of profit and loss. The usual showing is a single figure at the end of each month or year. At best it indicates only the *average* of the various elements in the profit and loss picture. A profit figure of \$100,000 might mean that in certain directions there were profits of \$200,000, with offsetting losses of \$100,000. A loss figure of \$100,000 might mean that there were losses of \$200,000, with offsetting profits of \$100,000.

Profits or losses are not mere accidents. They are the direct result of definite and appraisable causes. Being effects of this or that, causes obviously should be investigated, yet concerns have not been minded to study the sources of profit and loss as scientifically as the medical profession analyzes the causes of disease. Otherwise they would reflect them in their financial records, where they could be seen and inquired into.

Losses can come from purchasing at the wrong time, from selling below normal capacity, from manufacturing below normal capacity, from inefficient use of material, from inefficient use of labor, from quality below standards

PROFIT ENGINEERING

required, from prices below what should be charged for goods, from an excess of other outgo over other income, and from other causes. A single figure never has reflected and never will reflect the various contributions to profit and loss, yet what is more vital than for a business to know just where it is making progress and in what directions it is slipping?

VII. LACK OF EFFICIENT PROFIT CONTROL

Many business engines tear along on economic tracks with no engineer at the throttle. He may be in the cab, but he is chinning with the fireman or thinking about something else. This may be a far-fetched illustration, but it typifies many managements observed.

For instance, what forced one large watch company into a "creditor-committee stockholder-committee" condition, while another large watch concern was able to go on for over fifty years without a reorganization and without passing a dividend? Why should one large rubber company fail to provide reserves out of prior profits to cover a material loss of \$18,000,000 in one year, while in the same year another large firm in the same line protected itself by providing reserves out of profits in good years and thus covered its material loss of \$12,000,000? To what should be attributed the fact that one large soap company was able to operate successfully (and at capacity) from 1921 through to the recent depression, while another large firm in the same field suffered inventory losses of \$30,000,000?

The only answer to these questions is that we see, on the one hand, the result of concerns efficiently controlled by their managements, while, on the other hand, we see business machines out of the control of their responsible officers and at the mercy of adverse economic influences.

What does the usual business do when complications arise and adverse influences force some immediate action? Not having the kind of facts with which to foresee the future, and lacking controlling mechanisms, it finds itself totally unprepared to meet the issues which have arisen, and the

LOSSES AND THEIR REASONS

result is in actions of a negative character. Among these are: reducing prices, producing less volume, laying off part of the force, cutting wages and salaries, cheapening the quality of product, reducing or eliminating necessary expenditures, reducing advertising appropriations, exerting less sales effort, discontinuing essential research and development work, and the like, which usually operate to bring about the very condition that it was the intention to avoid.

Wise managements, on the other hand—the kind of managements which *control* the making of profits—prepare, foresee, anticipate, budget, survey, research, and plan and they discount coming difficulties because ready for them. Their hands are always on the throttle.

VIII. FAILURE PROPERLY TO ORGANIZE FOR PROFIT MAKING

A business deals with two great factors, money and men, *i.e.*, a successful business does. The other kind seems to be blind to all considerations but that of money. Inasmuch as it is men who use and make money, it should be obvious that men should be given the major attention, but in a way that will keep money in sight at all times. How is this to be done?

Through Organization. In the last analysis, everything that we do or say, make or use, is the product of human minds. The human is the power behind everything. Organization, therefore, is the proper adjustment of the relationship between human beings, in an effort to accomplish certain definite ends in life (profits in a business). If this adjustment is faulty, then we have an inefficient organization, incapable of making a success of what it undertakes. But if it is correct, logical, and developed along sound lines, then success is bound to be the result. Behind profit making stands man.

A budget figure is merely the expression, in terms of units of measurement or value or both, of what employees *think* in the present about the future, against which results later on can be compared. Budgeting is the work of harnessing and focusing the “thinking” of people in terms of future expectations. A budget statement is but the comparison of

actual results with what a personnel thought they would be. In other words, what counts are the men behind the budget. It is their ingenuity and skill (engineering) which enable them to design and use the mechanisms of business (plant, products, machinery, methods) with which to put their ideas into practice in the conduct of their affairs. In the proportion that this ingenuity and skill are properly directed, and utilized through organization, will profits be what they should be.

Yet, despite the logic of these arguments, regardless of the fact that organization work of the right kind yields the most practical results, it has been observed that concern after concern gives this vitally important subject only incidental consideration. In but few instances is there a place of major importance in the deliberations of managements regarding type and design or the organization, personnel relationships, fitting round pegs into round holes, organization charts and manuals, organization policies, and the like. The majority of organizations which the author has studied in the course of a busy professional career are hit-and-miss affairs.

IX. FAILURE TO PROVIDE ADEQUATE FINANCIAL RECORDS

Next in order comes the almost criminal neglect, on the part of those responsible for the conduct of our business affairs, to provide adequate financial records. By financial records is meant balance sheets, income statements, and cost reports. From the standpoint of comparability, accuracy, promptness, comprehensiveness, completeness, and understandability, there is so much to be desired in this direction as to lead one to feel perfectly free to criticize and condemn the sins of both omission and commission by those who design and compile these vital business documents.

One of the reasons for lack of control in business is the ancient and honorable custom of accounting (with painful accuracy plus checks and balances) for the past and present without much, if any, reference to the future. The usual accounting presents quite a complete array of "historical"

LOSSES AND THEIR REASONS

data, but little that can help one to become a "profit prophet." Comparing the present with the past as a guide to the future has probably done more to keep business from forecasting, anticipating, and becoming ready in advance of economic storm and stress than any other single thing. What the present results should be, what the future is likely to bring forth, the current relation to predetermined showings, and progress in terms of futures are vital considerations. Unless industrial concerns replace the present "historic accounting" with "accounting for futures," they will continue to rush past all danger signals like a train on a stormy night.

These important records constitute the chart and compass of the business ship—the starting point and finishing line of the race for success and profits. The prologue and epilogue of business, the record of the only language which banker, broker, prospective investor, stockholder, director, and executive can read and understand (?), are the balance sheets, income statements, and cost reports. Real profit control starts and ends with these records.

Yet, if one could intelligently and exhaustively examine into one hundred different businesses, it would be found that there were one hundred different kinds of financial records. At one extreme we would find some that were downright false in their revelations (purposely or through ignorance). Others would be incomplete and misleading. Still others would be lacking in so many respects as to be confusing. At the other extreme would be a few which could be said to measure up to the requirements of modern management. Some could be considered as covering up shortcomings and failure to secure results, instead of revealing the truth about things; others could be interpreted to mean that it is none of the public's business what the results of a given case are. Many could be passed on in the words of *Barron's*, for July 28, 1930, in speaking about the stock of Eastman Kodak:

But the whole story of the company's operations is not to be found in the earnings statement. In the first place, the income accounts which

PROFIT ENGINEERING

are made public are masterpieces of brevity. No sales figures, operating costs, or depreciation charges are shown. Only net income is available.

If it were possible for some to say that ten inches made a foot, while others could call fifteen inches a foot; if one could pass off 1,500 pounds as a ton, while another could demand 2,600 pounds, we would then have a real parallel to the facts shown by our present financial records. Yet, what is there, in the last analysis, more vital to the success of a business and to the entire commercial fabric of this country than adequate financial records? They reveal, in a given instance, the final results of the combined thinking and actions of all employed, whether salesmen, floor sweepers, clerks, or executives. Shorn of excuses, opinions, alibis, and arguments, the facts recorded in these records show the degree to which this thinking and action have been right or wrong. *The reflection of good or bad management can always be found in the right kind of financial records.*

When credit is asked, the banker demands a complete and detailed set of facts about the results of business, past, present, and (in some cases) the future. Public interest will some day demand—and get—the same kind of complete and detailed facts, regularly and as a matter of form.

X. UNWILLINGNESS OF MANAGEMENT TO SHOULDER THE FULL RESPONSIBILITY FOR PROFIT MAKING

A long professional experience leads to the conviction that the exceptionally successful management is the one which recognizes that it is its job to shoulder the responsibility for profit making and then acts accordingly. The managements in charge of losing ventures, or enterprises always on the edge of success but never quite “making the grade,” are the ones prone to place this responsibility on the shoulders of others. This shift of responsibility can be observed in so many instances—from management to superintendents and foremen through to workers, to sales executives through to salesmen, and to office executives through to clerks. In these cases the flow is in the wrong direction—it should be just the reverse.

LOSSES AND THEIR REASONS

At a meeting in Chicago some years ago, a man was talking on organization before the then Western Efficiency Society. On a large blackboard he had sketched the conventional organization chart, with places for stockholders and directors at the top, under which were placed spaces for officers, then for department heads, and finally for workers, salesmen, and clerks.

Emma Goldman was in the audience and, during the discussion, went to the blackboard and delivered a fiery outburst regarding the tremendous load on the backs of "wage slaves." It happened that that well-known engineer, the late Frank B. Gilbreth, was also present. When Emma Goldman had made what she thought was a "hole in one," Gilbreth went to the platform and, picking up the blackboard, turned it upside down and then explained how, in well-managed concerns, the entire load rested on the shoulders of management. The audience quickly saw, amid great applause, the import of what we are trying to convey to our readers.

In the face of the foregoing, the strange thing is not that "marginitis" is what it is, but that it is not more than it is. It all leads to the belief that, in considerable measure, we have succeeded in spite of ourselves, rather than because we have followed a well-ordered and proper procedure in business. On the other hand, it should be clear to those interested in the success of our industrial institutions that, if these shortcomings could be eliminated and a technique of planning and control substituted, we could reverse the present ratio and have 80 per cent of our concerns earn "adequate" profits, with 20 per cent in red or "dull" black.

As Owen D. Young has pointed out, we must not use our capital and labor for unprofitable purposes. We won't when we eliminate the causes of marginitis. In this process of elimination, profit engineering can be a real aid.

CHAPTER III

IMPORTANCE OF FINANCIAL RECORDS IN PROFIT MAKING

We contend that the average corporation report is not merely inadequate, but woefully inadequate; that it does not give the security owner the information to which he is entitled, and that it does not give him all of the information that is necessary if he is to make a competent decision as to whether the securities he owns should be held or disposed of.

Not only is there a lack of uniformity in financial reports as between one industry and another, but there is a wide variation in form as between various concerns in the same industry, and in some cases there is a sharp difference in the form of report issued by a single concern in two successive years—with no effort whatsoever to make comparison possible.—LAURENCE H. SLOAN, in "Corporation Profits" (Harpers).

If an engineer should attempt to run a boiler room with inaccurate water, steam, and other gauges, the result would be disaster—and the dismissal of the engineer.

Yet engineers of our business machines (managements) are attempting to operate the complex mechanisms entrusted to their care, with gauges that are antiquated, inaccurate, noninformative, misleading, and without uniformity and comparability. The results are inefficiency, losses, liquidations, reorganizations, failures, and the like. Managements responsible for these results lose their jobs—sometimes.

Financial records—balance sheets, income statements, and cost reports—are the business gauges.

It is not contended that these gauges in themselves will manage a business, but that they are to management what the compass is to the helmsman of a ship, and the instrument board to the pilot of an airplane, without which storms

IMPORTANCE OF FINANCIAL RECORDS

and fogs would mean wrecks. In other words, our modern accounting practice is in sad need of revamping—immediately and thoroughly.

The real purpose of financial records is to paint a picture of the results of business operations, the major factors in which are:

1. The *elements* in the results.
2. The *accuracy* of the results.
3. The *arrangement* of the results.

This picture of results should constitute the final and complete “interpretation” of the performance (actual and relative) of all engaged in a given business enterprise, both as a record of what has been and is being done and as a guide to what the future is likely to be. Consequently, it should be presented and arranged in language which the various parties in interest can readily understand (refer to Figs. 1 and 2 in this connection).

THE PARTIES IN INTEREST

Upon analysis, it will be found that there are six parties interested in this vital matter of adequate financial records, as follows:

1. There is the *stockholder*—the man or woman who has paid out his or her good money for a piece of paper representing an equity in some form of ownership in a business. He or she, with the other stockholders, is the business. If they do not receive or cannot get information in regard to how their money is being used, and what results its use is securing, then it is about the only form of ownership that is ignored. They have the right to secure and ultimately will demand (and get) the kind of information as to capital and income which will post them fully about “their” business.

2. The *directors* of a company are, or should be, vitally interested in the matter of adequate financial records. They are both legally and morally responsible for the conduct and direction of a business. The chart, compass, and sextant of such conduct and direction are the balance sheets, income statements, and cost reports. Directors fail to do their duty toward those who elected them to be their custodians if they leave any stone unturned fully to protect the stockholders’ interests.

3. The *managing executives* of a business are also interested in this matter of adequate reports. The actual conduct of a business is in their

COMPREHENSIVE BALANCE SHEET

Assets (Capital employed, showing how it is distributed)				Liabilities (Source of capital, showing where it comes from, or by whom supplied)			
Items	Amounts	Subtotals	Per cent to total of all assets	Items	Amounts	Subtotals	Per cent to total of all liabilities
Working assets:				Working liabilities:			
Cash resources:	\$ 86,090 70			Accounts payable:			
Marketable securities	46,568 91	134,459 61	9.1	Trade.....	\$ 163,288 44		
				Employees	6,786 58	\$160,075.02	10 9
Receivables:				Accrued:			
Customers' accounts and notes.....	\$201,101 89			Wages and bonuses....	16,086 43		
Officers and employees	46,807 92			Local taxes.....	6,688 28	22,774.71	1.5
Miscellaneous.....	2,898.91			Miscellaneous:			
Total.....	\$255,905.72			Reserves for relatives..	5,916.05	0.4%	
Less reserve for bad debts.....	7,000.00	246,303.72	16 8	Taxes for federal taxes.....	80,103 80	2 0%	
				Dividends payable..	18,050 00	1 8%	8 7
1. Total liquid assets.....				A. Total current liabilities.....		\$ 237,819.98	16 1
Inventories:							
Finished products and work in process.	\$254,704.06						
Raw materials and supplies	150,858.77						
Repair parts.....	36,090 88						
2. Total current assets.....							
Margin of current assets (2) over current liabilities (A) is \$698,697.06, or a ratio of 3.50 to 1.00, representing working capital							
Deferred charges:							
Experimental and development expense..	\$ 28,700.00						
Prepaid insurance and other expense.....	24,805 82	\$ 53,005.82		Reserves for contingencies.....		17,576 00	1 2

Fig. 1.

IMPORTANCE OF FINANCIAL RECORDS

COMPREHENSIVE BALANCE SHEET.—(Continued)

Assets (Capital employed, showing how it is distributed)				Liabilities (Source of capital, showing where it comes from, or by whom supplied)					
Items	Amounts	Subtotals	Grand totals	Per cent to total of all assets	Items	Amounts	Subtotals	Grand totals	Per cent to total of all liabilities
Working assets—Continued Investment in other companies.....			\$ 86,205.82	5.9	Working liabilities: Cont.				
8. Total current assets, deferred items and investments.....			\$ 917,692.86 (Margin of 3) over (B)	62.4	B. Total current liabilities and contingency reserves.....			\$ 255,905.98	17.8
Capital assets:					Capital liabilities:				
Plant and equipment:			\$ 94,800.00		Capital stock:				
Land.....					As per auditor's statement	\$1,000,000.00			
Buildings.....	\$280,054.49				Held in treasury...	\$ 40,000.00			
Machinery and equipment.....	270,808.28				C. Total capital stock.			\$ 900,000.00	65.4
Dies and patterns.....	59,884.11				Surplus:				
Office equipment, automobiles, etc.....	40,721.57				a. Paid in at organization Sept. 1, 1928...		\$188,411.28	(12.8%)	
Total plant.....	\$600,968.46				b. Earned: net profit current year.....	\$ 160,500.90			
Reserve for depreciation.....	203,561.96	457,406.49			Less: cash dividends \$78,800.				
Total property and plant.....			\$ 552,006.40	37.6	Deficit Dec. 31, 1928, \$15,976.76.....	\$ 94,776.76			
Patents and good-will.....			1.00		Total earned surplus.		65,823.14	(4.5%)	17.8
4. Total capital assets.....			\$ 552,007.40	37.6	C. Total surplus.....			\$ 254,234.37	82.7
					C. Net worth (C1 + C2)			1,214,234.37	
5. Total all assets.....			\$1,469,680.85	100.0	D. Total all liabilities..			\$1,469,680.85	100.0

Fig. 1.—(Continued.)

PROFIT ENGINEERING

COMPREHENSIVE INCOME STATEMENT¹

Items	Amount	Per cent	Amount	Cents net sales dollar
1. Gross income from sales... . . . .	.	.	\$2,000,000	105.00
2. Deductions.				
A. Returns and allowances.... .	\$ 25,000			
B. Freight out	75,000		100,000	5.00
3. Net income from sales.. . . .			\$1,900,000	100.00
4. Manufacturing cost of sales:				
A. Cost of capital (depreciation charges) ² .	\$100,000	8 18		
B. Cost of direct labor...	200,000	16.26		
C. Cost of direct material..... . .	400,000	32.53		
D. Total direct cost	\$700,000	56 92		
E. Insurance, taxes, light, and heat	\$ 36,000	2.92		
F. Maintenance.....	50,000	4 06		
G. Power...	250,000	20.83		
H. Supervision.....	75,000	6 10		
I. Technical research.....	10,000	.81		
J. General indirect costs.. . . .	79,000	6 42		
K. Proportion of administrative expenses (30 per cent).....	30,000	2 44		
L. Total indirect costs.....	\$580,000	43 08		
M. Manufacturing cost of sales . . . . .	.....	100 00	\$1,280,000	64 74
5. Selling cost of sales:				
A. Direct cost (salaries, commissions, incen- tives).....	\$ 95,000	25.68		
B. Sales traveling and living expenses.. . . .	25,000	6 75		
C. Salaries and expenses, sales offices....	10,000	2 70		
D. Advertising and sales promotion	100,000	27 00		
E. Sales discounts in excess of 2 per cent..	10,000	2 70		
F. Sales research.....	25,000	6 75		
G. General sales expense.....	35,000	9 47		
H. Proportion of administrative expenses (70 per cent).....	70,000	18 95		
I. Selling cost of sales..... . . . .	...	100 00	370,000	19.47
6. Total manufacturing and selling cost of sales..	. . . . .	. . . .	\$1,600,000	84.21
7. Operating profit..... . . . .	.....	. . . .	\$ 800,000	15.79

FIG. 2.

IMPORTANCE OF FINANCIAL RECORDS

MEMORANDUM COVERING ADMINISTRATIVE EXPENSES ABSORBED ABOVE

Item	Amount	Per cent
A. Executives' salaries and bonus.....	\$ 50,000	50 00
B. Office salaries and expense.....	20,000	20 00
C. Legal and patent expense.....	5,000	5 00
D. Economic research.....	5,000	5 00
E. General items.....	20,000	20 00
F. Total.....	\$100,000	100 00

The above covers the operating side of the business of manufacturing and selling.

Items	Amount	Per cent	Amount	Cents net sales dollar
8. Financial income and outgo:				
A. Income:				
1. Purchase discounts.....	\$ 10,000			
2. Interest and dividends on investments.....	2,000			
3. Interest on receivables.....	1,000			
4. Interest on bank balances.....	500			
5. Profit from sale of investments.....	1,500			
6. Profit from sale of assets.....	500			
7. Other financial income.....	2,500			
8. Total financial income.....	\$ 18,000			
B. Outgo:				
1. 2 per cent sales discount.....	\$ 20,000			
2. Interest on trade payables.....	1,500			
3. Doubtful accounts.....	5,000			
4. Loss from sale of investments.....	15,000			
5. Loss from sale of assets.....	20,000			
6. Other financial outgo.....	25,000			
7. Total financial outgo.....	\$ 86,500			
C. Excess the one over the other (red if loss).....			\$ 68,500	3.61
9. Net business profit.....			\$ 231,500	12 18
10. Interest borrowed capital.....			13,000	0 68
11. Taxable profit.....			\$ 218,500	11.50
12. Income taxes.....			33,000	1.73
13. Surplus profit.....			\$ 185,500	9 77
14. Dividends:				
Preferred.....	\$ 12,000			
Common.....	25,000		37,000	1 96
15. RETAINED PROFIT.....			\$ 148,500	7 81
16. Surplus profit to business profit.....				80.01
17. Retained profit to surplus profit.....				80.06

¹ Fictitious figures used.

² Localized to definite machine and floor spaces and charged to work done.

FIG. 2.—(Continued.)

PROFIT ENGINEERING

hands, through delegation of powers by the directors who represent the stockholders. Their work from month to month and year to year begins and ends with the facts contained in these vital records. In them is reflected a full account of their stewardship. Executives should see to it that all the facts are presented in a way that can cause no doubt or question as to the meanings of these facts.

4. *Bankers* are also vitally interested in this great subject. They have to be whether they want to or not. To render intelligent advice regarding the securities or management of a company and pass on credit, they must come to a conclusion, favorable or unfavorable, which can be reached only after a careful analysis of the corporate records. If these records are incomplete, misleading, and without explanatory material, the banker cannot properly pass on credit or the worth of securities or management. He may do the concern a gross injustice, through an adverse decision and through no fault of his own.

5. *Brokers* are in the same position as are the bankers—perhaps more so. They must of necessity cover a wider range in the study of the securities of companies, and in much shorter time. Facts, correctly and intelligently set forth about the affairs of a company, constitute the raw materials of their business. Unless they can secure these promptly, and in a comprehensive way, they are not in a position to assist and advise the investing public to the extent that they should.

6. The *prospective investor* is likewise a party in interest. He has money to invest in something. He wants to know what he is investing in and has every right to know. He may or may not study financial records himself. If he does not, he relies on his broker or his banker. To keep him out of the things he should not invest in, and guide him to invest in the right securities, call for financial records which are “adequate” in every sense of the word.

It can be seen, therefore, from the standpoint of stockholders, directors, managing executives, bankers, brokers, and prospective investors, that corporate financial reports which tell the “true” story, and in a complete way, are absolutely indispensable in this complex business world. Without such reports the individual interested in them is as uncertain of what the facts are as he would be if using a magnetized watch.

It is granted, of course, that all of the accounting in the world will not make profits or losses. People do this. But false or incorrect or incomplete data can be put on paper that serves as a guide to the actions of these people who do

IMPORTANCE OF FINANCIAL RECORDS

produce the results, which actions are right or wrong in the proportion that the data fail to reveal true facts.

In support of this statement is the following by John F. Sinclair, in the Jan. 11, 1930, issue of *Cleveland Plain Dealer*:

The drop in the net profits of the United Cigar Stores of America for 1928 from \$8,352,000 to \$4,525,000 as a result of "a different theory of accounting," which the new management, headed by George K. Morrow and his associates, insist upon, is surprising.

When a drop of almost 50 per cent, amounting to millions of dollars, can be handled in this fashion, it shows the importance of a standardized audit in the business world.

Probably no other problem confronting business is more important in developing confidence than this. With millions of stockholders being added to the lists of industrial corporations annually, the word "depreciation" should mean, in every balance sheet, a definite thing. So should the word "reserves" and so should the words "gross" and "net" profits.

MANAGEMENT'S RELATION TO FINANCIAL RECORDS

The engineering of profits—for it is an engineering job—starts with facts and ends with them. Obviously, no man's judgment—which is the basis for decisions and actions—can be more intelligent than the knowledge he gains from the perusal of pertinent and properly compiled information about a business. Financial records constitute the starting point and finishing line in the profit race. Our accountants and controllers are our "profit engineers."

But what are we to say of these engineers in light of the business shortcomings and wreckage of the past? G. Charter Harrison, one of the ablest accountants of the country, gives us this answer in "The Accountant Develops Imagination," in the October, 1929, issue of *Factory and Industrial Management*, as follows:

Lack of imagination on the part of accountants is a more serious matter than may appear on the surface—it is no hasty statement to say that it has held up the advance of business thinking and of business methods more than any other single factor and has involved industry in incalculable loss. It would be fair to go even further and say that 50 per cent of the bankruptcies of large institutions in the past could

PROFIT ENGINEERING

have been avoided if the accountants of these concerns had developed their imaginations as much as they had their bumps of analysis.

Are our accountants and controllers to blame for the fact that they are not better engineers of profits? No, indeed! Management is to blame, and management alone.

Management, being the responsible party in the conduct of business, can say what proper accounting practice should be and then insist on getting it. An accountant or controller is not the one to blame for putting out the kind of report that resulted in this choice bit from the staid *Wall Street Journal* (from Ripley's book "Main Street and Wall Street")—

Whether by accident or design, such reports are drawn so as to withhold from the stockholder what he most desires to know. When he is told that "the increase in mortgages and ground rents payable represents a mortgage given in connection with purchase of additional property," he says to himself that an intelligent bootblack could have guessed as much. When he reads that "the decrease in miscellaneous accounts payable is due to withdrawals by affiliated companies to reduce their indebtedness for construction and other purposes," he refrains from calling the report a mess of tripe only for fear of insulting an industrious and self-respecting farmyard animal.

As additional evidence that management is not only the party responsible for our inadequate financial records but the one on which the work of making them adequate rests, Prof. W. O. Douglas, of the Yale Law School, in an article "Have You the Right to Be in Business?" (*American Magazine*), said that, of the six reasons why business men are likely to fail, the first was "failure to keep proper books of account," and the second was "negligence in applying bookkeeping facts."

WHAT FINANCIAL RECORDS REALLY MEAN

Let us dig a little deeper and develop the true significance of, and the real meanings behind, financial records, particularly from the standpoint of profit making.

IMPORTANCE OF FINANCIAL RECORDS

Obviously, if these records are tools to be used by management in conducting its affairs, they should be good tools and properly maintained; otherwise they are useless and misleading and, therefore, dangerous. If an executive takes the position that he knows more about his costs or his financial position than his books show him, the quicker he feeds these books to the boilers the better. There should never be two sources of information about the same thing.

These books are only sheets of ruled paper carefully arranged in binders. People place entries and figures in the debit and credit columns on these various sheets. The entries and figures so recorded do not fly out of the air from nowhere to those who merely collect them and "tack" them on the sheets in whatever way whim dictates. Principles, laws, policies, and rules govern (or should govern) their placement. These have been accepted, whether sound or otherwise, because it is the desire and intent, in most cases, to make these books the reflection of what all engaged in a particular business have done and are doing, whether in selling, buying, making, shipping, engineering, or administration, in contributing to profits or the lack of them.

Let us get away for a moment from binders, sheets, and systems, and imagine that we have a crystal glass and the gift of "second sight." We see in panoramic fashion the play of economic forces in buying and selling, the work of those in machining and assembling or otherwise processing the products, the efforts of salesmen to get orders, the work of draftsmen and designers, the steps taken by foremen and managers in administering the business, the deliberations of the directors in determining company policies, the efforts of transportation companies in moving goods, the payment by customers for goods received and to vendors for materials purchased, and the thousand and one other things done by the various parties involved, all the while making a minute-to-minute record of transactions and impressions which we set down in systematic style and arrange in an intelligible and accurate manner. What would

be the result? We should have a dynamic, live, "moving-picture" record, in which imagination and the ability to reason were factors, reflecting all the happenings observed, and which we could call *books of account*.

This is what books of account should be—not static history or graveyards of dead material from which a happening cannot be resurrected and projected on the mental screen. Books of account should be the most interesting things about a business, for they tell a story in both absolute and relative form that can be as absorbing as any book of travel or historical account, particularly if they are looked upon as the "play of people," expressed in figures.

So much for significance and meanings.

HANDLING OF DEPRECIATION

In the face of all the foregoing, what are we to say of a management which sets up on its books a total asset figure of nearly \$2,000,000, which has to be reduced by over 50 per cent to reveal true values, owing to the failure of this management to provide for depreciation over the years, and its lack of judgment in capitalizing items which should have been considered as current expense?

In the famous Youngstown Sheet and Tube—Bethlehem Steel merger trial of the summer of 1930, the matter of the bonus paid to Eugene T. Grace came up. It was found that the profits on which his bonus was calculated was the gross profit "before depreciation." From the standpoint of the economics involved and the principles of modern accounting, Grace received a higher bonus than he otherwise would have received.

The published balance sheet of General Motors Corporation for 1931 shows total assets of \$1,300,267,222 with land, buildings, and equipment of \$604,100,810. On the liabilities side depreciation reserves amounting to \$241,472,694 are shown. If we adjust to net values, as is the commonly accepted accounting practice, then the results become

IMPORTANCE OF FINANCIAL RECORDS

Plant.....	\$ 604,100,810
Depreciation reserve.....	241,472,694
<hr/>	
Net plant value.....	\$ 362,628,116
Total assets.....	\$1,300,267,222
Depreciation reserve	241,472,694
<hr/>	
Net assets.....	\$1,058,794,528

In the Consolidated Summary of Income of the Timken-Detroit Axle Company and Subsidiaries for 1931, there is this excerpt:

Profit before Federal and state income taxes, interest, and depreciation...	\$1,079,360.57	
Interest expense.....	\$ 14,521.25	
Depreciation.....	706,609.09	
Provision for Federal and state income taxes.	29,901.63	751,031.97
<hr/>		
Net profit.....	\$ 328,328.60	

Under correct methods of accounting, the net operating profits, after financial adjustments but before taxes and dividends, would be shown as \$358,230.23 instead of \$1,079,360.57, because depreciation would have been added to operating costs, and interest expense to "other deductions."

In other words, there are those who either do not believe in depreciation at all or consider it as a deduction from profits instead of as an addition to cost.

The treatment of depreciation on our books is another angle to which too little intelligent consideration is given. In asking the question, "Where is that depreciation reserve?" the August, 1930, issue of *Factory and Industrial Management* answers editorially as follows:

... our present method of accounting so confounds us that we think we are providing for depreciation when actually we are not.

Depreciation often appears as a liability when it actually should be an asset, represented by money in the bank. The fundamental law is set down by Kimball—"No profits should be declared until all losses to capital through the revenue account have been replaced from revenue."

PROFIT ENGINEERING

Failure to do this results in paying out in dividends part of our capital, and when we have an opportunity to put things in shape for future production, we find that all we have is a figure on the books—Depreciation Reserve—so much. You cannot buy new machines or equipment with this.

RECEIVABLES

The item of receivables is another that rarely tells the true facts concerning the money due a business, except in lump sums. There should be a division as between trade and other receivables, a division as to notes and accounts receivable, and a classification to indicate the past due accounts and by how much they are past due. It is doubtful if, in many cases, personal receivables should be included in current assets.

INVENTORY

The Inventory Account represents capital employed in the business. When we speak of the famous “banker ratio” of current assets to the current liabilities, we think of the margin of the one over the other—as working capital—a large part of which is inventory. This account is, therefore, a vital account, yet so false is it in many statements that it almost seems as if the managements want to “kid” themselves into a sense of fancied security, which the real facts in the case would not support for a moment.

There are many factors entering into this inventory valuation: how it is priced and costed, the amount of scrap and obsolete parts, the excess carried (ranging in our experience from five to forty years’ supply in certain instances), the overruns and lack of material to balance manufacture in terms of normal requirements, and many other things. To the extent that managements fail to reconcile their inventory valuations with these factors can they be said to be guilty of gross negligence.

RESERVES

The matter of reserves, other than for depreciation and bad debts, is another phase of accounting about which a

IMPORTANCE OF FINANCIAL RECORDS

great deal could be written. The Eagle-Picher Lead Company reported a net loss of \$463,015 for the first quarter of 1930. A dispatch from Picher, Okla., quoted A. E. Bandelari, president, in part as follows:

Regarding loss shown by Eagle-Picher Lead Company in first three months of 1930, practically the entire amount was inventory decline caused by severe drop in price of both lead and zinc since the first of the year. Our inventories are taken at cost or market, whichever is lower. To write them down to market Mar. 31, it was necessary to write off over \$450,000. In other words, the first three months we had just about an even break on our operations. Metal markets are now showing improvement and, after metal prices advance, appreciation in our inventories will reduce and correspondingly offset loss we have had to show in the first quarter.

The result in this case was that the quarterly dividend to the common stockholders had to be passed.

Management knows, or should know, in dealing with basic commodities like rubber, copper, cotton, tin, lead, zinc, pig iron, steel, and a lot of other items, that price swings are cyclical, averaging three to five years each over the last 140 years of our history. From the standpoint of sound dividend policy, with each month and quarter and year reflecting real operating results, and management efficiency being properly gauged, why should not reserves be built up out of the profits in good years, to offset the material losses which are inevitable in bad years? Management has no excuse to offer excepting that of ignorance, or unwillingness, because for many years engineers and accountants have shown how to carry a Purchasing Profit and Loss Account on the books as part of what is known as "variation accounting."

SURPLUS AND NET WORTH

There is probably no more important account from the standpoint of stockholder, banker, and prospective investor, than the one called "surplus." If the word means anything at all, its meaning should be as clear as that of the word "cash." No one wonders about the latter term, but who is there, in or out of a given business, that can interpret what

PROFIT ENGINEERING

is meant by the word "surplus" when it is followed by a single figure?

In other words, how many statements tell the real story by dividing this important account into such elements as the following?

Capital surplus.

Earned surplus.

Surplus arising from appreciation of fixed assets.

Appropriated surplus for causes properly listed.

The only conclusion possible, if books of accounts are supposed to reveal facts, is that a single surplus figure does not reveal the real story.

The "net worth" is supposed to be the value of the ownership in a business. What happens, however, when the assets have in them items like good-will, patents, and copyrights, for which there has been no exchange of value? The net worth then contains intangible factors and does not reveal real values. If it is sound to deduct such items in determining the book value of common stock and surplus, then such items should be eliminated from the assets and liabilities, which would result in figures representing "tangible assets" and "tangible net worth." Intangibles could then be added to the assets and liabilities sides, to make total assets and total net worth. A stockholder would then be able to calculate both his tangible and intangible increment over his investment.

In this connection, and as an example of changing figures to tell the same story, the 1930 statement of Cleveland Worsted Mill Company indicated liabilities of:

Accounts payable.....	\$ 281,812
Notes payable.....	1,200,000
Other payables.....	157,747
<hr/>	
Current liabilities.....	\$ 1,639,059
Capital stock (\$100 par value).....	14,322,000
Surplus.....	8,302,557
<hr/>	
Total liabilities.....	\$ 7,658,502

IMPORTANCE OF FINANCIAL RECORDS

After a reorganization the set-up was:

Current liabilities	\$1,639,059
Capital stock (no par value)	2,000,000
Surplus	4,019,443
<hr/>	
Total liabilities	\$7,658,502

Here was a case where a *red* surplus of \$8,302,557 became a black \$4,019,443, yet the net worth remained the same in both instances—\$6,019,443.

CONTINGENT LIABILITIES

It is only in recent years that balance sheets have begun to show the liabilities of a contingent nature, either as a footnote or in the body of the statement.

In the Dec. 31, 1929, balance sheet of Pacific Mills there is this footnote: "The Company has contracted to purchase cotton, wool, cotton cloth, and supplies for the total amount of \$818,155, which, as of that date, was \$4,906 above the market."¹

In one of the statements of the current liabilities of R. H. Macy & Co., Inc., there is included \$224,749.73 for "trade creditors for merchandise in transit."¹ Among the current assets in the statement of Abraham & Straus, Inc., for Jan. 31, 1930, there is an item of \$199,406.26 covering "merchandise in transit."¹

Other treatments are:

A. The Quaker Oats Company, December, 1929, balance sheet: "The Company's contingent liability at Dec. 31, 1929, with respect to foreign drafts discounted, was \$308,115.30, and at Dec. 31, 1928, was \$417,572.31."¹

B. The Timken-Detroit Axle Company and Subsidiaries, Dec. 31, 1931, balance sheet: "The Company and/or its subsidiaries were reported to be contingently liable in the amount of \$1,475,507.20 for customers' installment accounts discounted under a repurchase agreement, and in the amount of \$799,986 for customers' notes discounted by Silent Automatic Corporation."

C. Van Raalte Company, Inc., Dec. 31, 1929, balance sheet: "Undeclared unpaid cumulative dividends on the outstanding first preferred

¹ From booklet "Financial Statements in Annual Reports to Stockholders," Metropolitan Life Insurance Company.

PROFIT ENGINEERING

stock amount to \$575,268.75, covering the two years and three months ended Dec. 31, 1929.”¹

The above is evidence that more and more firms are recognizing the value of indicating on their statements the items of a contingent nature and that, in time, the custom will become universal.

UNSCRAMBLING PAST AND PRESENT

We need—and the need was never greater—an unscrambling process in connection with our balance sheets and income statements. The past may have been successful when large plants were built, and out of the profits a large surplus accumulated, with excess funds not needed in the business invested in marketable securities. But along comes that disease referred to as “marginitis,” caused by using less plant, selling less volume at reduced prices, and the like. An entirely different picture should be seen; but because the past is “averaged” with the present in the financial records, the future cannot properly be gauged.

Businesses, in other words, are always two-sided. There is the operating side (present) and the financial side (past).

The following case will illustrate what is meant. The concern in question had capital employed of \$1,740,939. Profits for the year in question amounted to \$68,345. Profit return on the investment was 3.92 per cent. Yet the balance sheet of this firm was one of the best ever reviewed.

The balance sheet and income statement were divided so as to picture the two sides of the business—the operating side (manufacturing and selling) and the financial side (marketable securities and secured loans). The \$1,740,939 in total assets became \$1,286,541 in operating assets, and \$454,398 in financial assets. Liabilities were correspondingly divided. The Income Statement told the real story. The same division showed \$34,162 in financial profits, or 7.53

¹From booklet “Financial Statements in Annual Reports to Stockholders,” Metropolitan Life Insurance Company.

IMPORTANCE OF FINANCIAL RECORDS

per cent on the financial assets; with \$34,183 in operating profits, or only 2.66 per cent on the operating assets.

Needless to say, it did not require much selling effort to force a clear-cut division in the books as between the operating and financial sides of the business, so that the two kinds of business could be revealed separately. Incidentally, the directors of the company in question took immediate steps to better the operating results.

INCOME STATEMENTS

As much could be written about income statements as has been presented with reference to balance sheets. Inasmuch, however, as subsequent chapters will deal largely with the income statement, the treatment here will be in bird's-eye-view fashion with reference to betterments that are coming, as follows:

1. Depreciation will be included as a direct charge like labor and material, as cost of capital.
2. Maintenance and power will be shown separately.
3. Research costs will be shown separately as to sales, technical, and economic research.
4. Administrative expenses will be apportioned to selling and manufacturing expenses.
5. Income-statement items will be compared against budgeted standards, with variations noted.
6. Variations between budgeted and actual items will be classified under various headings as "causes" of the variations.
7. The 2 per cent cash discount will be included in "other outgo."
8. Cash discount above 2 per cent will be included in selling overhead.
9. In case business has part of its sales subject to special discounts plus cash discounts, and the balance as net sales subject to cash discounts only, regular prices of *all* sales will be considered as income from sales, and special discounts carried to selling overhead.
10. Bad debts will go to "other outgo."
11. Purchase discount will go to "other income."
12. Freight out will be a deduction from gross sales.
13. Direct costs of selling will be kept separate from indirect selling costs.
14. Net sales will be considered as 100 per cent.
15. Each item will be expressed in cents of the sales dollar.

CONCLUSION

It is realized that the surface has only been scratched in this treatment, owing to the fact that it is quite impossible adequately to cover so important a subject as financial records within the confines of a single chapter.

The aim has been, however, to call attention to the crying need for reform in the preparation and compilation of balance sheets, income statements, and cost reports, because they are the keystone in management's work of making adequate and regular profits.

Profit making is a matter of first planning, then putting the plans into operation, and finally in knowing the results. Records are man's devices for recording this information regarding these steps. Hence, profit making starts and ends with these documents. Efforts to make profits without the aid of proper financial records can end only in failure to attain the profit objective that otherwise would be possible. As will be seen in subsequent chapters, they form the genesis of profit engineering.

Figures 1 and 2 are merely suggested as illustrative material and not to be considered as standard practice.

CHAPTER IV

THE USE OF GRAPHICS IN PROFIT MAKING

Charts have become an indispensable management mechanism for (1) recording and transmitting information, (2) formulating policies and making decisions, and (3) determining performance and directing action.—DAVID B. PORTER, in "Management's Handbook" (Ronald Press).

Of late years, some of the more progressive industrial executives and engineers, realizing the deficiencies in the existing methods of management control, have sought to evolve something better and, as a result, have turned to graphical presentation of facts and relationships. They have sought to visualize and thus to facilitate mental processes as much as possible.

As we carefully analyze why graphical methods have been adopted more and more, we begin to wonder why they have not been used before, as we find the evolution of "graphics" to be startling in character.

The engineer deals with factors of stress and strain in the design of his product, in terms of graphics. The mechanic of ordinary ability so organizes his thought that he builds and constructs by learning to analyze correctly and apply all the practices of the past, in a graphical way. In mathematical deductions, both engineer and mechanic depend upon and are fortified with:

1. Judgment by eye.
2. Numerical mathematics—arithmetic and algebra.
3. Analytical mathematics—geometry, trigonometry, analytical geometry, and differential and integral calculus, which have been productive of such aids as the triangle of forces, the funicular polygon, the distortion diagram, the graphical solution for section moduli and moments of inertia, and such devices as the planimeter, slide rule, log paper, and the theory of alignment charts.

After the engineer or mechanic has developed his machine or structure, he must employ some means to convey the results of his studies to bodies of workmen and foremen, who are responsible for manufacturing products. Each man must in some way be made to conceive the nature of form, shape, and dimension, as well as the *relation* of the various parts. We find here an evolution to graphics, as follows:

1. Spoken and written word.
2. Models for comparison.
3. Pictorial sketches.
4. Modern mechanical drawings, incorporating many conventional presentations so that absolute relationship may be clearly shown.

There is another way to view this evolution. The accountant, realizing the difficulty in getting his employer to understand relationships, in his analysis of financial and cost conditions, has supplemented his mass of figures by simple and compound graphical charts, with the result that he has been able to secure the attention of his superiors to a much greater extent.

Sales managers have for some little time been making use of maps in combination with colored and numbered pins, enabling them to get a bird's-eye view of present and future conditions, thus making it more easy to plan campaigns than would be the case if dry figures were studied.

Railroads have recognized the advantages and greater freedom from human error, in the control of traffic conditions, through graphic visualization. This is evidenced not only in the miniature railroad systems, where signal pins, pegs, or runners give the schedule, location, and progress of traffic, but also in the actual mechanisms used in signaling trains.

Our modern armies, to a greater extent than is generally thought possible, are controlled through the medium of charts, boards, pins, colors, and other graphic devices. Our technical papers are more and more making use of graphical presentation to illustrate the important points

of their articles. Illustrations in books are but another way of presenting facts in a graphic manner. The advertising manager uses graphics to advantage in bringing to the attention of the public quality and quantity relationships in the products he is desirous of selling. Market letters in financial circles are more and more making use of charts to show tendencies of stock, bonds, and commodity prices. As all are aware, statistical publications, in order to be of real service, must show charts so as to make relationships easily noticeable and interesting. The clock face, the sun dial, the gauge glass, the compass, the watchman's clock strip, theater diagrams, the thermometer, and other mechanism of like nature are forms of graphical presentation which we would not think for a moment of dispensing with.

The reason for the above is that the average person does not possess a synthetic mind or keenly perceptive intellect. Most minds are of the reflective or analytical type. It is difficult for most people to take a mass of unrelated facts and figures and "see" them in an orderly, related, and coordinated whole. Few minds can visualize entireties, or things in mass formation. They reason from parts and elements rather than from perceiving the whole. The "mind's eye" in most people is far from developed. As a result, we find few people who are highly imaginative in a practical way, or who can visualize from disassociated facts and figures.

Even those possessing unusual powers of perception and synthesis are often handicapped in getting broad viewpoints, unless assisted by means which relieve the mind from the burden of intense concentration and long periods of application. Graphic presentation enables the mind to grasp details quickly and puts things on a semiroutine basis. This helps to speed up the mental processes and reduces mental fatigue to a minimum—and this mental fatigue is particularly noticeable in our industrial executives.

Imagine, if you can, trying to teach a child to play an instrument through written descriptions of scales and notes,

instead of the graphical methods we know so well. Try describing some rare painting to your friend, through the use of the spoken word, and notice how quickly you will bore him. Show him a painting of the thing you are trying to describe, and he will rave over it.

What do we mean by graphics? Of the five senses—sight, hearing, smell, taste, and touch—there is only one that is most used, in so far as executive work is concerned—the sense of *sight*. For instance, in planning, controlling, and getting out production in our shops, we do not use the senses of smell or taste at all. Hearing is employed to some extent, as is also touch; but their employment is of minor importance. The organ most used is the eye—"the camera of the mind"—which, photographing all things within its vision, gives the brain, as the chief executive of the body, the basis for reasoning, formulating decisions, and initiating action. In other words, the chain is eye, to brain, to action. Should it be any different when it comes to the matter of planning, controlling, and making our profits? Consequently, anything which facilitates the work of the eye is worthy of consideration and adoption. The painting of the artist portrays the beauties of nature for our eyes. The camera reproduces scenes and views that are worth our attention, for our eyes.

Graphical presentation in profit making pictures the essential happenings and relationships in business for our eyes and is to business what the artist and camera are to us in other things.

If we cannot do away with the conventional presentations of a graphic nature in our shops, in our offices, and in our sales work, it is doubly important that managements employ graphics in the work of profit making; hence this plea at this point in the book treatment, as a preliminary to an unfoldment of graphical presentation in profit engineering.

CHAPTER V

PROFIT PLANNING ANALOGOUS TO PRODUCTION PLANNING

New inventions, better management, increased sales, and more profits do not come from Thurston's hat. They are not subject to the wave of a magician's wand. . . .

To build an estate from profits from the shoe business, one must know besides how to make them, what to make, when to make, what they cost to make, where they are purchased, who purchases them and why—and a few more whys.—HORACE C. DUNN, assistant chief, Domestic Commerce Division, U. S. Department of Commerce, in *The Cleveland*, August, 1929.

Having, in previous chapters, considered business and profits from their economic aspects, set forth the reasons for losses, and stressed the importance of financial records in profit making, we now come to the matter of laying the foundation for a more intelligent consideration of what to do in business to assure the making of the *excess* of the income from sales over the outgo for costs.

The natural question which immediately arises is, "Can profits be provided for on an assurance basis?" In attempting to answer this question, let us put it this way. If the making of a profit is an "after the fact" affair and is the result of accident, chance, blind faith, and happenings which have been attributed to "acts of God," then attempts to develop a technique of profit engineering would be mere waste effort. Under such conditions we could expect, in more cases than not, that there would be an excess of the outgo over the income (which statistics show to be the case), for under these conditions men would have little or no control over profit making.

On the other hand, if there is something about this matter of profit making which makes it a "before the fact"

PROFIT ENGINEERING

affair, if there are those who deliberately set out to make profits and then make them, if prediction and predetermination can be helpful in keeping the income greater than the outgo, if profit elements can be appraised and treated in the same way as the matter of providing for labor and material in fabrication, then it must be apparent that we can lift profit making out of the realm of hope and prayer and transfer it to one which has all the earmarks of an engineering technique. How? *Through profit planning!* You may say at first that such a claim is absurd, especially if you have battled from year to year to make sure of a margin over the outgo without more than ordinary success—in some years. But let's see.

LESSONS FROM INSURANCE AND WARFARE

We know, for instance, that each year we can definitely count on a certain number of fires, accidents, deaths, thefts, illnesses, broken windows, and other things. As a result a great actuarial and statistical science has been built up as the keystone of the insurance business which, bluntly put, enables it to bet against the certainty of uncertainty.

There is probably nothing more uncertain in business than the making of profits, which is all the more reason why a scientific approach to the matter is vitally necessary.

There is another and perhaps better example to use than that of insurance. Military warfare is the oldest, largest, best organized, and most efficient business the world over. Despite the fact that warfare is full of the unforeseen, the indefinite, the intangible, and the entirely unexpected, a science of war has been developed which can be taught, as well as an art of war which can be, and is, practiced.

Warfare has its objective, its intelligence, its anticipation, and its planning, as will be seen from views of military leaders, as follows:

Objective:

In war, everything is correlated; every move has some reason, seeks some *object*; once that object is determined, it decides the nature and importance of the means to be employed.—FOCH.

PROFIT PLANNING

To strive always for the highest possible success, with the utmost energy, is the first principle of all warfare.—VON BERNHARDI.

War in general, and especially the result of battles, depends upon the superiority of forces at one point.—FREDERICK THE GREAT.

Information:

The unknown is a constant factor in warfare, and to overcome the unknown, which accompanies us to the very contact with our opponent, there is only one recourse—the search until the last moment, even on the battlefield, for information.—FOCH.

By the word “information” we denote all the knowledge which we have of the enemy and his country; therefore, it is, in fact, the foundation of our ideas and actions. . . .

As contemplation of war continually increased and its history every day assumed more of a critical character, the urgent want appeared of the support of fixed maxims and rules, in order that, in the controversies naturally arising about military events, the war of opinions might be brought to some one point.—VON CLAUSEWITZ.

Anticipation:

The task is to solve the riddle in *advance*. That kind of mental labor must bear rich fruit. It will best prepare victory.—VON BERNHARDI.

An army must be constantly ready to oppose *all* the resistance of which it is capable.—NAPOLEON.

If we desire to defeat the enemy, we must proportion our efforts to his powers of resistance.—VON CLAUSEWITZ.

Where there is no strategic protection, there may be strategic surprise. In other words, we must always strive to create events.—FOCH.

Planning:

The activities belonging to war divide themselves into two principal classes—into “preparation for war” and for “war itself.”—VON CLAUSEWITZ.

The way in which Von Clausewitz here judged of things, drew conclusions from movements and marches, calculated the time of the marches and the points where decisions would take place, was extremely interesting.—BRANDT.

PROFIT ENGINEERING

This lesson has to do with three things: eyes turned toward the *interesting* directions; arms stretched toward the *dangerous*; a body keeping its freedom of movement for striking in the *chosen* direction.

The various phases of the battle remain the same—to prepare, to execute, to profit by the decisive attack.—FOCH.

It will be seen, if sufficient thought is given to these matters of insurance and warfare as businesses which have their scientific aspects, that in the business of making and selling things in commerce and trade, the vital factor—*profit*—is something which is entitled to much more consideration than is usually given to it.

PLANNING A TRIP

If a man is going to take a trip somewhere, he must determine where he wants to go, when he wants to arrive, what road he will take, and when he will have to leave to arrive at his destination at the predetermined time. In other words, he must plan his trip.

Taking the trip just planned requires something more than the mere planning, important as it is. Packing the bag, getting the needed papers together, watching the time, getting a taxicab early enough to reach the station before departure of train, wiring ahead for hotel accommodations and business appointments, getting the right train, and locating the right space on the train are all elements in the execution of the plans made. So with the matter of planning profits. The execution of the plans must be so controlled as to insure that the profit objective will be attained.

ROMANCE OF GENERAL MOTORS

In the spring of 1920, this great corporation found itself in what appeared to be a very strong position. There was a shortage of automobiles due to the limitation of car production during the war. Every car that could be produced could be sold at almost any price. Nothing on the business horizon indicated any economic storms, and General Motors was sailing along at full speed in bright sunny weather.

PROFIT PLANNING

In September of that same year—and almost overnight—values began to fall owing to the liquidation of inflated war values. The squalls which hit this company found the executives totally unprepared and, before control of the business ship could be obtained, it was in a position where it had to go to the bankers for \$80,000,000.

Going to bankers for enormous sums in good times is one thing. It is something vastly different, however, when a business ship is trying to ride out the storms of depression. To the everlasting credit of the banking interests appealed to, let it be said that they had both confidence in the management of General Motors and courage to let it have its financial requirements.

The result of this experience is stated in these words of Alfred P. Sloan, Jr., president, in an address before the Automobile Editors of American Newspapers, Sept. 28, 1927:

. . . we recognized that our first duty was to obtain a proper control over the operations of this big ship. We should not be satisfied to go along, unconcernedly, when times were good, with no thought of the future. We should first devise scientific means of administration and control whereby we should be able to project ourselves as much as possible into the future and discount changing trends and influences and, second, that we should be prepared at all times to alter the course of this ship of ours promptly and effectively, should circumstances develop that required us to do so. This has been accomplished and I feel that at the present time . . . no matter what the future may bring forth or no matter what changes may take place, irrespective of how suddenly they make take place, we have at all times the organization and machinery to deal with these changes in such a way that the adverse effects upon the great interests that we represent will be reduced to the very minimum that human ingenuity and scientific management can make possible.

Keep in mind that this statement was made in September of 1927. In the light of this declaration of policy covering administration and control, of organization and machinery, of human ingenuity and scientific management, what happened to General Motors in 1930 and 1931?

In the late summer of 1929, executives of this corporation began a consideration of the prospects for 1930. It was

PROFIT ENGINEERING

inconceivable, they felt, for 1930 sales to exceed 85 per cent of the 1929 sales. It might even be that sales would fall to 65 per cent of the 1929 level. The position taken, however, was that regardless of whether sales fell to 65 per cent or rose to 85 per cent, there must be sufficient earnings so that the holders of the 43,500,000 shares of the common stock would receive dividends. Five separate charts (which will be described in detail later) are reported to have been made—at 65, 70, 75, 80, and 85 per cent of the 1929 capacity. In each case the first item provided for was profit. The business would have to get along on what was left. At company headquarters and at each of the units of this great corporation, men set to work figuring and planning in detail just how it could all be done.

Using, as the gauge, surplus net income to the tangible net worth, we find that for 1930 there was a surplus net income of \$153,766,000 or a return of 16.807 per cent on the tangible net worth; while in 1931 the surplus net income was \$96,770,000, or a return to the tangible net worth of 10.944 per cent. Averaging the two years 1930–1931, we find that the surplus net income amounted to \$125,268,000 yearly, or a return to the tangible net worth of 13.925 per cent.

The remarkable thing about this situation is that the combined net income for the two years, amounting to \$250,536,000, exceeded the combined preferred and common dividend requirements for the same period by 28 per cent, despite a drop in sales for 1930 and 1931 of 40 per cent over those of the two years 1928 and 1929.

PREMISES OF PROFIT PLANNING

As a clue to the way to go about this matter of profit planning, let me cite the case of a former associate of the authors—in charge of the professional work mentioned in the Introduction—who caught the meaning of profit planning as it applied to his own little “business of living.” He was a newly married man, and he and his wife organized their affairs on the basis of this approach to the problem:

PROFIT PLANNING

Income monthly.....	\$.....
Rent	\$
Insurance premiums.....	. . . . .
Savings . . . . .	. . . . .
Christmas and vacation . . . . .	. . . . .
New automobile...	30.00*
<hr/>	
Fixed deductions	\$.....
<hr/>	
<i>Balance to live within.. . . .</i>	<i>\$.. . . .</i>

* Accumulation covering two years taken with old automobile, and new one secured automatically.

The significant thing about this case was that this man and wife wanted those fixed deductions hard enough really to work for them by living within the balance, even when the balance was a reduced one. Today this little "firm" has its own home, a new automobile every third year, money in the bank (and in investments), and altogether is successful as a business.

This is essentially the procedure recommended for a business—if *it wants profits hard enough really to work for them.*

The question naturally arising at this point is with reference to the practicability of a procedure such as outlined. In other words, can a business be operated on the basis of providing for profit first, then finding that the balance is enough for the costs?

Without planning, the procedure would be quite impossible. With the right kind of profit planning, however, there is no getting away from the fact that a proper profit objective could be approximately attained. The matter of the right kind of profit planning, therefore, is something to which consideration must be given.

Over the years we have observed the steady development of a technique of production planning which has given us what we term "mass production"; in fact mass production would be quite impossible without it. It might be well, then, to inquire into this matter of production planning a little, in an effort to develop analogies between it and profit planning.

PROFIT ENGINEERING

As a guide to this let me quote from the author's book "Graphic Production Control" (McGraw-Hill) (page 35) as follows:

In the first place, what are we going to try and accomplish through the use of graphic production control? Let me put it in the form of a standard: "The time to consider the matter of manufacturing a definite number of units of production, in a definite time, within a definite cost limit, at a definite efficiency, is *before* the work is started in the shops, and not after."

How will we convert this ideal into a practical reality? We can answer this by defining "graphic production control" as "that mechanism which provides a means whereby, through visualization or graphical presentation, all details in connection with production can be intelligently planned in advance and efficiently dispatched; whereby each machine, man, or gang can work with reference to all other machines, men, or gangs; whereby the shop management can, through advance knowledge, provide the necessary elements in the way of materials, machines, tools, drawings, and labor."

With this as our guide, we can now present the analogies between production planning and profit planning as follows:

ANALOGY BETWEEN PROFIT PLANNING AND PRODUCTION PLANNING

FACTOR	PRODUCTION PLANNING	PROFIT PLANNING
1. The objective (purpose)	To make the specified product, in the right manner, in the required time	To make the necessary profit, in the right manner, during the fiscal year
2. Definite steps that are necessary to attain the objective (task)	Manufacture of a given product by performing definite operations on or processing definite materials	Securing a sufficient volume of sales income to insure a <i>desired</i> excess of income over outgo
3. How task is performed (elements used)	Through use of plant, machinery, and tools, based on definite standards as to time and costs	Through service, quality, proper deliveries, best price, and practice of economy, based on definite standards as to all performances involved in task
4. Who is to perform task (personnel)	Operating personnel best adapted to a given work	Executive personnel best adapted to a given work

PROFIT PLANNING

ANALOGY BETWEEN PROFIT PLANNING AND PRODUCTION PLANNING.—(Continued)

FACTOR	PRODUCTION PLANNING	PROFIT PLANNING
5. Basis of planning (performance desired)	Plan with reference to delivery or completion dates, and work back from these to starting points, which will insure scheduled performance later on	Plan with reference to results which should be accomplished at end of year, and work back from these to starting points which influence these results
6. Machinery of planning (schedules)	Definite schedules daily, weekly, and monthly, showing details as to definite production requirements	Definite budgets or standards, daily, weekly and monthly, showing details as to cost and profit requirements necessary to insure ultimate profits necessary.
7. Progress (attainment)	Reports covering completions and follow-up, showing variations from schedules (with reasons therefor), and suggested recast of schedules	Reports showing relation of actual results to budgeted performance, with variations listed (showing reasons therefor), and outline of steps necessary to better results

INCOME AND OUTGO

Coming more directly to the matter of profit planning, we must obviously give thought (1) to securing sufficient income from sales and (2) to seeing to it that the outgo is sufficiently less than the income to provide for the required excess over the outgo.

First of all, we must reverse the usual mental treatment of the outgo in which labor and material are considered first, then the expenses of doing business, then dividends (?), and finally additions to surplus (??). We should substitute this arrangement:

1. Addition to surplus account	}	Profits	}	Costs
2. Reserve for contingencies				
3. Common dividends				
4. Preferred dividends				
5. Interest on borrowed capital				
6. Selling expense	}	Expenses		
7. Administrative expense				
8. Manufacturing expense				
9. Depreciation as capital costs	}	Direct outlay		
10. Direct materials				
11. Direct labor (first lien)				

PROFIT ENGINEERING

We do not wish to be understood as urging that labor is to be neglected by considering it as the last of eleven items in the list. Humans who work for a living are entitled to human consideration, and profit control does *not* contemplate overlooking the human factor or "taking it out on labor." The safety and perpetuation of a business are also important and, if not considered first in profit planning, will likely be overlooked. If we plan on labor as a first lien as the eleventh item, and addition to surplus account as the first consideration, the nine items in between are bound to be taken care of.

Perpetuation of a business, provision for necessary protection, return to owners and investors, and keeping one's credit unimpaired, all support the arrangement above cited.

Among the many elements which could be given as having a bearing on the vitally important matter of securing required income from sales are the following:

1. Demand and consumer viewpoint should be the keystone.
2. The volume in the industry and the relation of a given plant's volume to it should be determined.
3. Past history, present trends, opinion of sales manager, and the views of salesmen should be fully considered.
4. There should be a market analysis.
5. Turnovers of inventory, plant, and capital employed, both actual and desired, should be calculated.
6. Pertinent financial relationships should be ratioed.
7. Buying capacity of trade, by territories and according to products, should be developed.
8. Profitability of products by lines should be known.
9. The matter of adding new lines and dropping old ones should be investigated.
10. There should be a modern form of salesmen's incentives.
11. Sales forecasts should be developed, with quotas established according to lines, by territories, and for each salesman.
12. Sales trips should be planned for salesmen.
13. Sales expenses should be standardized, giving each salesman a definite allowance based on his scheduled calls.
14. Charts and statistics should be maintained in order that progress may be known, as well as the lack of it.

PROFIT PLANNING

DOLLAR TARGETS

In profit planning there are four major things to consider in connection with the financial affairs of business:

1. Income from sales.
2. Profit.
3. Capital employed (assets).
4. Sources of the capital (liabilities).

Because 100 cents (a dollar) is a more dynamic way of stating the static 100 per cent, let us have as our targets

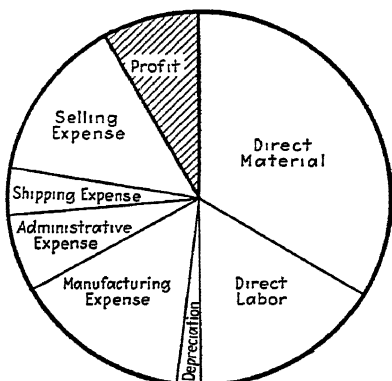


FIG. 3.—Sales dollar.

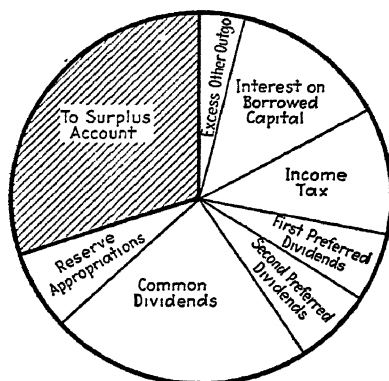


FIG. 4.—Profit dollar.

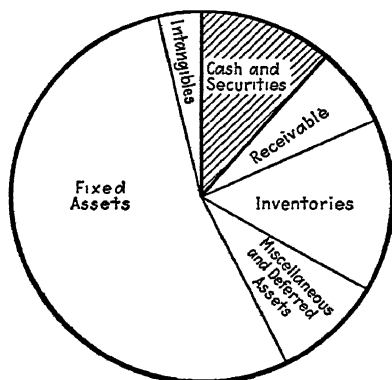


FIG. 5.—Assets dollar.

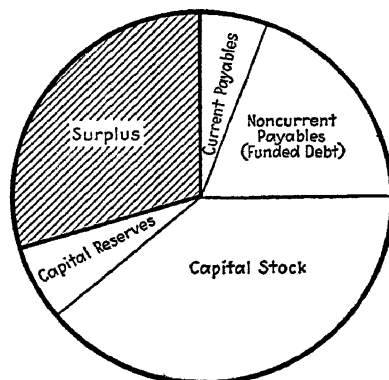


FIG. 6.—Liabilities dollar.

imaginary dollars divided as shown in Figs. 3, 4, 5, and 6. These are the factors to which our planning must apply.

PROFIT ENGINEERING

PROFITS DEFINED

That there may be a common understanding throughout this text as to the meaning of the word "profits," let us divide it as follows:

1. Operating profit—after manufacture and sale but before other income and outgo.
2. Net business profit—after other income and outgo but not counting interest on borrowings or on investment.
3. Taxable profit—after interest on borrowings and considered as the basis for calculating Federal income tax.
4. Surplus profit—after all costs and fixed charges, and available for dividends, reserves, and addition to the surplus account.
5. Retained profit—after dividends and appropriations for reserves, and available as surplus.

"IT'S EASY TO MAKE BUSINESS PAY"

A long professional experience has convinced the author of the soundness of the following conclusions:

1. That the success or failure of a man engaged in business depends more upon his skill as a prophet than upon his ability as a producer.
2. That external conditions exert a more potent influence on profit making than do the internal ones.
3. That gains coming from the ability to foresee future trends and to provide against them far exceed the margin of profit which competition permits.
4. That successful men do little unintelligent guessing about vital business matters.

The acceptance of these conclusions spells but one thing—*profit planning*.

Supporting evidence is given in an excellent article in *Nation's Business*, for March, 1929, under the title "It's Easy to Make Business Pay," by Fred W. Shibley, vice-president, Bankers Trust Company, New York, as follows:

It is simple to succeed in business if one exercises common sense and intelligently obeys the laws of economics. Let this be repeated again and again. There is no other way leading to net profits. The requirements of these laws, to meet modern conditions, are

1. That a fair profit must be earned upon the capital invested.

PROFIT PLANNING

2. That the selling price of the product shall be such as to permit of a fair profit on the capital invested and at the same time be satisfactory to the buyer.

3. That the efficiency of management and the tools of management shall be such as to insure a production cost which shall permit the sale of the product at the price set and at the same time insure the profit demanded to satisfy invested capital.

The great mass of business men throughout this country who are producing less from their several enterprises than a fair return on the capital invested, whether farmers, coal operators, textile manufacturers, merchants, or traders in any form, can entertain the hope of bettering their present condition if they shall earnestly strive to do so.

Their success or failure is in their own hands. It is recognized that they have much to learn, but that which is to be learned is simple and easily understood if the will exists to endeavor to understand.

Please note the words "if the will exists to endeavor to understand."

In connection with this statement of Shibley, where is the executive who would build a plant, install machinery, manufacture a product, organize a sales force, or initiate a great advertising campaign, without first planning and then controlling the various steps from mental concept through to final results? We call it "engineering" (the root words being the Latin *ingenium* meaning "ingenuity," and the French *engin* denoting "skill"), and all to the end that the business venture may be profitable.

Should all other factors in business be "engineered," and profits—the objective of business—left to accident, chance, or blind faith? Profit planning will make profits more easy to make.

PLOTTING THE PROFIT COURSE

There is not a person reading this book who would permit his family to take an ocean voyage if he knew that the officers of the ship were unfamiliar with the art of marine navigation, ignorant of the important work of plotting the course in advance, making soundings, and taking readings to note location and variation from prescribed course, anticipating storms, and adjusting speed and course of ship when necessary. The reader would not expect

the crew and passengers to know much about such things but would insist that the officers know this art and practice it.

Is it any different when it comes to the matter of the business ship, sailing the oceans of commerce and subject to the economic storms and stresses which affect all concerns sooner or later? It is not expected that salesmen, clerks, workers, and the minor executives know and practice the art of "business navigation," but it is expected that the officers and pivotal executives—responsible to stockholders for profits—know and practice it; otherwise a business wreck is always a possibility.

Officers and pivotal executives of a business ship can and should plot the profit course on a basis analogous to the charting done by the officers of the ocean vessel. They should also be able to observe variations from the course laid out through readings and soundings, just as do the ship officers. They should be able to anticipate storms and stresses in business and alter speed and course of the ship of commerce in accordance with the conditions. This plotting will be fully described in subsequent chapters.

CHAPTER VI

CALCULATING THE PROFIT REQUIREMENTS

. . . to the extent General Motors is able to employ additional capital in extending its operations, all other things being equal, so its profits must necessarily increase because each dollar must make a showing for itself. If, for illustration, \$100,000,000 were left in the business out of a given year's earnings, and a reasonable return on that \$100,000,000 is 15 per cent, then the next year's profits should increase, all things being equal, by \$15,000,000 or we will not have done a constructive thing.—ALFRED P. SLOAN, JR., president, General Motors Corporation, in address before Automobile Editors of American Newspapers, Sept. 28, 1927.

In any attempts to plan in advance the making of profits, the first consideration which thrusts itself upon us is the matter of the profit margin.

In other words, will we plan for some profits, any profits at all as long as they are profits, or can our profit objective be determined and expressed in a definite and understandable way? Should not our profit goal be *quantitative*? Desire for unusually excessive profits, on the one hand, or profits so small as to mean an insufficient return on the capital investment, on the other, can be ruled out of our considerations in favor of the viewpoint that, inasmuch as we are thinking in terms of the needs of a legitimate business enterprise, doing its best to serve the needs and wants of its trade, it has necessary and defensible profit requirements.

These requirements are two in number:

1. Profits should be adequate.
2. Profits should be made continuously.

PROFIT "PAR" NECESSARY

Bobby Jones once related that when he decided no longer to play against his competitors but always against "par," he was able to more easily and more consistently

win the games played thereafter. Having a definite goal of his own to play against, he did not let himself become disturbed over his competitors' scores.

The same logic applies to business. Determine your own "par" as to profits, and then play against that. Keep in mind that *what a business does is meaningless unless there is something against which to measure its accomplishments.*

The questions for us to answer, therefore, are: What are adequate and regular profits? Against what measurement bases should they be related? Can we "unify" the elements in profit making?

In an attempt to answer these questions in an intelligent way, let us first present some essential considerations.

MEASURING MANAGEMENT'S PROFIT RESULT

In the last analysis, it is management's job to make profits from its efforts in manufacturing and disposing of goods. To do this it employs capital. We call it "capital employed," by which we mean the total of the assets. Management is the custodian of and trustee for the owners of this capital. It has at its disposal certain cash and securities, advances to customers called "receivables," amounts which it has put in a reservoir (or inventory), certain prepayments it has made which are called "deferred charges," investments of various kinds, and advances against the future called "plant and equipment," all of which, along with certain miscellaneous items, constitute the total of the assets, as "capital." On this *base*, the management should net some definite return as profit as a "gross" on the values it manipulates.

Consequently, the real investment in the business from the management's standpoint is the total of these assets, less depreciation and bad debt reserves, less certain inventory adjustments, less idle plant which cannot be used, less excess funds not needed in the business and invested in marketable securities, and less intangibles like patents and good-will for which there has been no exchange of value. The *net* capital employed is the measure of how much it

PROFIT REQUIREMENTS

takes properly to conduct the business "as an operation." The liabilities side of the books shows the source of the capital employed, indicating where it comes from or by whom it is supplied—creditors, investors, or owners.

The profit that management should earn on this "operating yardstick" should be enough to provide for excess of other outgo if financial expenses are greater than other income, pay interest charges on borrowed capital, take care of Federal and state income taxes, pay preferred and common dividends (especially the latter), make such reservations as are necessary to protect the business, and leave a consistent amount for addition to the Surplus Account.

The true measure of the success of management, therefore, is the return it can earn on the net assets it employs in the conduct of the business. Net operating income to the total net tangible assets becomes the management gauge covering gross profits.

Bliss, in his well-known book "Financial and Operating Ratios" (Ronald Press) says (page 78):

From the operating point of view as distinguished from the stockholders' point of view, the real measure of the financial return earned by a business is the percentage of operating profits earned on the total capital used in the conduct of such operations. This is the measure of the earning power of the operations of a business on the capital used therein, regardless of from what sources such capital may have been secured. In judging the operations and transactions of a business, the most important considerations include the amount of capital used and the profits resulting from the operations conducted. The percentage of operating profits earned on the total capital employed states concisely the relationship in question.

THE OWNER'S PROFIT YARDSTICK

Because the owners of a business (the stockholders) are the ones to whom profits belong, it is obvious that what is left out of the gross that management can earn on the total capital employed, for disposition by the representatives of the owners (the directors), as measured against their equity in the business, is the profit gauge from this standpoint.

Owner's equity is in the form of what is called "net worth," made up of investment (capital stock), the increment added to it out of earnings and left in the business (surplus), and such appropriations from prior earnings, after having been carried to surplus, as may be necessary to provide for contingencies as they may arise (capital reserves). Any deductions from assets to arrive at net tangible capital should also be deducted from net worth.

The true measure of the owner's earnings, therefore, is the relation of surplus net profit (known as net income) to the total of the tangible net worth.

Bliss (*ibid.*) says of this relationship (page 57):

The relation of surplus net profit to net worth—the percentage earned on stockholders' investment—is the final summing up of all other relationships and measures of business efficiency. It results from, and includes, all other relationships, earnings and expense ratios, turnovers, etc. Favorable or unfavorable gross margins, expenses, operating earnings, turnovers, etc., are all included in and affect the final net return on the stockholders' investment. It is, in the last analysis, the measure of the commercial success obtained in the management of the affairs in all three management functions—merchandising, operating, and financial.

NET WORTH AS STARTING POINT

Thus we arrive at two fundamental conclusions:

1. Net operating profit to the net tangible assets, as capital employed, constitutes management's gauge of results.
2. Surplus net profit (net income) to the tangible net worth is the gauge of results for the stockholders.

Now the consideration becomes this: Shall we start with gross profit on assets and work through to net profit on net worth, or, *vice versa*?

It is the standard practice in all financial and industrial circles to judge the success of an enterprise on the basis of the ratio of the net or surplus profits to the net worth. In tabulations in the monthly bulletins of The National City Company, New York, regarding corporate earnings, there are these designations:

PROFIT REQUIREMENTS

Net profits are shown after Depreciation, Interest, Taxes, and Other Charges and Reserves, but before Dividends.

Net Worth includes Book Value of Outstanding Preferred and Common Stock and Surplus Account at beginning of each year

That this is logical will be seen when we realize that, under our capitalistic form of society, a business exists for the benefit of its owners. It must render service, of course, but the expectation is that this service will be *profitable* to those who own the service mechanism called a business. Hence it seems that we should start with owner's net return and work back through to gross on the management base (net assets), *the real basis for purposes of profit budgeting*.

There is another side to it which justifies this conclusion. The strength of a company is indicated by a large net worth, reflecting the results of successful and conservative management in the past, both in making profits and in retaining enough to build up a large surplus which it does not dissipate through a too liberal dividend policy or unwise moves covering expansion and the like. *The ratio of the net worth to the net assets is, therefore, the most important gauge of the real strength of a business.* This ratio will be known as the "net worth content."

We can begin, then, with this proportion:

Net worth	net assets	net profit	net profit
content	: as base	:: to net assets	: to net worth
(X)	(100%)	(Y)	(Z)

Regarding the value for *X*, an exhaustive analysis of a number of concerns—both well as well as sick—indicated par for "net worth content" as 80 per cent, with 72 per cent as the bottom limit.

For 463 concerns, 1927-1928-1929-1930, according to reports of Standard Statistics Company, Inc., this net worth content averaged 78.96 per cent.

WHAT IS FAIR PROFIT RETURN?

Regarding the rate of return to net worth (*Z*), let us put it this way.

One can take a million dollars and invest it in good stocks and bonds and, by diversification and ordinary care in watching yields, make approximately 6 per cent yearly on his principal in normal times. This is the return for money, as money.

When he takes the same million dollars, however, and puts it into a business, an additional factor enters into the consideration. Not only must he continue to earn 6 per cent on the investment as the return for money, but he must do much better. Why? Because engaging in business is accompanied by certain risks and uncertainties. Business is precarious and constantly changing. Energy and effort and time and thought—and oftentimes worry—are needed to make business not only successful in the present but on a par with or ahead of competitors in terms of futures.

In other words, there must be 6 per cent, plus an additional rate which protects and rewards the business “as a business.” What this extra should be is something to which too little consideration has been given by executives in the past. It should be obvious that there is a decided difference between investing in good stocks and bonds, where no management effort is required of the investor, and becoming financially interested in a business where there is a likelihood of loss and possible failure, and where management of the highest order is necessary.

In a hearing before the Federal Trade Commission, in May, 1918, in the case of the American Newspaper Publishers’ Association against the manufacturers of newsprint paper, regarding what was a fair price for newsprint paper, the author presented this principle:

PRINCIPLE 10. RATE OF FAIR RETURN

. . . a return to the investor in an industrial, can be said to reconcile the difference between a safe and sure return, and a possible but unguaranteed return, if the rate is two . . . to three times the guaranteed return . . . , as an average over a period of years.

The words “as an average over a period of years” is a most important consideration.

PROFIT REQUIREMENTS

If we consider the "going" rate for money as 6 per cent (more for convenience than statistical accuracy), the return that a business should make should range from 12 to 18 per cent yearly, with 15 per cent as the desirable or "mean" requirement, as surplus net profits to the net worth, and on a cyclical basis.

Support of this principle was given in the words of Alfred P. Sloan, Jr., president, General Motors Corporation, whose statement will be found in the keynote quotation in this chapter.

A standard proportion would, therefore, be:

Net worth	net assets	net profit	net profit
content	: as base	:: to net assets	: to net worth
(80%)	(100%)	(12)*	(15%)

In other words, 12 per cent on the assets would net 15 per cent on the net worth, when net worth to net assets is 80 per cent.

PROFIT EFFICIENCY

The 463 firms previously mentioned averaged yearly for the four years in question 9.47 per cent on their net worth which, on a "net worth content" of 78.96 per cent, was equivalent to 7.48 per cent on their net assets (78.96×9.47). What these firms should have done, and the relation of this to what they did do, can be seen from this calculation:

$$78.96:100\%::X:15\%$$

$78.96 \times 15 = 11.84\%$ required as surplus profit on
net assets

$$\frac{7.48 \text{ actual}}{11.84 \text{ required}} = 63.18\% \text{ as what can be termed } \textit{profit efficiency}$$

TURNOVER OF CAPITAL EMPLOYED

But there is another factor to consider—and a most important one. Owners could have no surplus net profits left from the management's gross profits on its operations,

* Six per cent for the money as "interest on the capital investment," and 6 per cent to the business "as a business."

PROFIT ENGINEERING

if there was no sales revenue. Hence, the rate of net profit in the sales dollar must also be considered, because turnover of the capital employed has a most important influence on the matter of profit making. In fact, turnover of capital should govern what the net profit in sales should be. If net profit on net assets should be *absolute*; on sales income it should become *relative*; if a *constant* on net assets, on sales income it should be a *variable*. If the need is 12 per cent on net assets to mean 15 per cent on the net worth, and we have two turnovers of capital employed annually, then 6 per cent on sales is sufficient; whereas, if the turnover is only one-half (or once in every two years), then we need 24 per cent in the sales dollar yearly.

About this point Bliss says in the book previously referred to, page 65:

The relation of surplus net profit to the volume of business is the measure of profit on turnover as distinguished from the relation of surplus net profit to net worth, which is the measure of return earned on investment. The surplus net profits of a business should be considered as related to both the net worth and the volume of business done. The one measure expresses the return on the investment, the other the margin of profit on the volume which produced that return.

TWO PROFIT LAWS

Based on these considerations, we can now state two profit laws:

Margin Law.—That in the proportion that the net worth varies to the capital employed (the assets), so must the net income to the assets (the management's base) vary to net a constant on the owner's equity in the business—the net worth.

Turnover Law.—That the rate of turnover of capital employed by the management (the assets) governs the amount of net income to be secured from sales revenue, to net sufficient on the assets to equal the constant required on the owner's equity in the business—the net worth.

THE FORMULA APPLIED

The five-year showing of General Motors Corporation (1927 to 1931, inclusive) will be seen from the figures shown at top of page 73.

PROFIT REQUIREMENTS

Year	Sales	Surplus profit	Net assets	Net worth
1927	\$1,269,520,000	\$235,100,000	\$ 912,920,000	\$714,050,000
1928	1,459,760,000	276,470,000	1,036,540,000	811,710,000
1929	1,504,400,000	248,280,000	1,080,120,000	903,810,000
1930	983,380,000	151,100,000	1,045,207,000	914,852,000
1931	808,840,000	96,770,000	1,006,850,000	884,207,000
Average.....	\$1,205,180,000	\$201,540,000	\$1,016,450,000	\$845,720,000

Reducing these dollar values to percentages, the formula works out as follows:

$$\frac{\text{Surplus profit on sales income—16.723 per cent}}{\left(\begin{array}{l} \frac{83.203 \text{ net assets}}{\text{net worth : content}} : \frac{\text{net income}}{100\%} :: \frac{15\% \text{ on}}{\text{as } X} \text{ assets : } \frac{\text{net}}{\text{worth}} \end{array} \right)} = \text{P.E.}^* = Y$$

$$X = 83.203 \times 15\% = 12.480\% \text{ as surplus profit required on net assets}$$

$$Y = \frac{12.480\%}{1.1856} = 10.526\% \text{ surplus profit required in net sales income}$$

$$\text{P.E.} = \frac{16.723\% \text{ actual surplus profit in sales}}{10.526\% \text{ required surplus profit in sales}} = 158.866\%$$

The yearly "profit-efficiency" readings are:

Year	Percentage	
1927	219.500	
1928	227.080	
1929	183.400	
1930	112.046	Average for the years 1930
1931	72.960	and 1931—91.866
Average....	158.866	

In contrast to the General Motors results are those of the Inland Steel Company, which is one of the most successful among the firms in the steel business. For the years 1927 to 1931, inclusive, the Inland Steel figures are shown at top of page 74.

* Profit efficiency.

PROFIT ENGINEERING

Year	Sales	Surplus profit	Net assets	Net worth
1927	\$59,310,000	\$ 6,810,000	\$ 89,080,000	\$70,270,000
1928	64,900,000	9,340,000	96,300,000	58,700,000
1929	69,570,000	11,710,000	103,200,000	65,910,000
1930	52,460,000	6,500,000	103,040,000	67,410,000
1931	31 610,000	1,260,000	115,590,000	66,080,000
Average	\$55,570,000	\$ 7,130,000	\$101,440,000	\$65,670,000

Calculating the profit efficiency, as in the case of General Motors, we have:

$$\frac{\text{Surplus profit on sales income—12.830 \%}}{\left(\begin{array}{l} \text{64.738 net assets net income 15 \% on} \\ \text{net worth : as :: on assets : net} \\ \text{content 100 \% as X worth} \end{array} \right)} = \text{P.E.}$$

$$\frac{0.5487 \text{ as capital employed turnover}}{\quad} = Y$$

$$X = 64.738 \% \times 15 \% = 9.710 \% \text{ as surplus profit required on net assets}$$

$$Y = \frac{9.710 \%}{0.5487} = 17.725 \% \text{ surplus profit required in net sales income}$$

$$\text{P.E.} = \frac{12.830 \%}{17.725 \%} = 72.384 \%$$

The yearly profit-efficiency readings are:

Year	Percentage	
1927	64.607	
1928	106.073	
1929	118.555	
1930	64.280	Average for the years 1930
1931	12.715	and 1931—38.753 %

Average 72.384

An analysis of these studies will show that three variables were reconciled in the calculations:

- A. Surplus profit in net sales income.
- B. Capital employed turnover.
- C. Net worth content.

PROFIT REQUIREMENTS

Motors had a rapid turnover (1.1856), as against a much lower one for Inland (0.5487). Motors required surplus profits in net sales income of 10.526 per cent, while Inland required 17.725 per cent. Motors was able to get surplus profit in net sales income of 16.723 per cent as against Inland's 12.830 per cent. Motors had the larger net worth content (83.203 per cent), as against a lower one for Inland (64.738 per cent), thus requiring Motors to earn a relatively greater surplus profit on net assets (12.480 per cent), as against the lower requirement for Inland (9.710 per cent).

WHAT ABOUT INTEREST CHARGES?

In the previous chapter we spoke of "net business profit" and defined it as profit "after other income and outgo but before interest charges on borrowed or invested capital."

In support of this definition, the author presents some views given in his testimony before the Federal Trade Commission, previously referred to, as follows:

PRINCIPLE 6. INTEREST ON INVESTMENT

Costs of operation should not have included in them any charge covering interest on investment, as this would serve to anticipate earnings, through including a profit before it was made. No profits can be made in a business until products are sold. What is actually put into a business is the investment. What is actually earned is the interest or return on the investment.

PRINCIPLE 7. INTEREST ON BORROWED MONEY

Interest on borrowed money should not be made a charge against costs of operation, as borrowed money, from the viewpoint of operation, is equivalent to capital invested. An industrial with sufficient capital to build, equip, and provide working funds, should pay the returns on the investment, out of the profits. Borrowed money indicates insufficient capital invested, making it necessary to bring in additional funds, and the interest charge should likewise come out of the profits.

It can be seen, therefore, that "net business profit" is the profit that is left after deducting manufacturing, sales, and financial costs, but *before* deducting interest charges on borrowed or invested capital. The "operating profit" would be that left after deducting costs of manufacture and sale

PROFIT ENGINEERING

from net sales income, but *before* adding other income and deducting other outgo. The "surplus net profit" would be that left for the owners, the amount after deducting interest charges and income taxes, but *before* deducting dividends, reserves, and additions to surplus account.

UNITARY PROFIT FORMULA

At any rate, it will be seen that we have brought together into a "unitary profit formula" such elements as:

- Capital employed.
- Net worth.
- Net sales.
- Net profit.
- Capital employed turnover.
- Profit relations to assets, net worth, and sales.
- Profit efficiency.

Based on the use of such a formula, a definite profit objective can be set up.

It may be argued that the requirements of the formula are entirely "out of bounds," owing to the extreme difficulty for the average concern to attain them. The same thing might be said of 72 as par for eighteen holes of golf. Few men "average" 72 in playing this great game, yet it is doubtful if any who play would advocate raising par to 90 so as to make the game easier. If profits should be both adequate and regular, the proper requirement should be a matter of record and the relation of the actual to it determined, letting the chips fall where they may. Keep in mind, however, that we are speaking of surplus profit as an average over a period of years. The average for the 463 concerns previously mentioned, for the four years 1927, 1928, 1929, 1930, was 63.18 per cent in profit efficiency. There are those in industry who would say that the average cyclical profit efficiency was much less than this. For any given year the formula requirement might be $7\frac{1}{2}$ or 21 per cent, depending on the period of years position. The single year is nothing to go by. In a period of 133 years, swings have averaged 5.34 years each.

PROFIT REQUIREMENTS

BUILDING BACK TO OPERATING PROFITS

When we know what we should earn as surplus profit on the net assets—the management “base” to use in budgeting profits—it is a simple matter to build back to the gross profit known as the “net operating profit,” which, generally speaking, can be done in this way:

Surplus net profit required.....	\$.....
Federal income tax.....	.....
<hr/>	
Taxable profit... ..	\$.....
Interest on borrowings.....	.....
<hr/>	
Net “business” profit.....	\$
Plus or minus excess other income or outgo. ....	.....
<hr/>	
<i>Net operating profit</i>	<i>\$.....</i>

Conclusion.—It may be argued that it is highly unfair to some firms, while unduly favoring others, to employ a single profit formula with which to measure the profit efficiency of all firms, on the ground that one measurement cannot possibly weigh all the diverse influences that make for profits or their lack. On the other hand, a dollar of capital is a dollar of capital in any line of endeavor, and money as money is worth a fairly definite rate of return, as are the effort and energy and ability of management, whose task it is to also make profit for the business “as a business,” over and above the equivalent to interest on the investment.

After all, it is management which is responsible for the financial policies which mean too much capital in a business. It is management which is responsible for scrambling inefficient high-cost units with efficient low-cost ones. It is management which is responsible for any unwarranted overcapacity in its operating units. It is management which stands for wasteful merchandising methods. It is management which fails to provide the right kind of incentives for workers, salesmen, supervisors, and even executives. It is management which puts up with inefficiency in machines and processes in manufacturing products. It is management which allows pernicious labor policies to lower man-power

morale. It is management which stands for the wrong kind of banker domination and dictation in the face of what plain common sense indicates as imperative. It is management which is responsible for failure to know costs and standardize them. It is management which is charged with the responsibility to budget its income and outgo.

It is clearly evident that we must devote much more attention to the matter of profit, as profit, than we have, particularly if we view it as the "life blood," the "motive power" of business, without which "business death" first becomes a possibility, then a probability, and finally an actuality. *There should be a profit par in every business to play against.*

CHAPTER VII

THE "PROFITGRAPH" AS A "VARIABLE INCOME STATEMENT"

There exists in all human beings the instinctive curiosity to resolve a complex body into its parts so as to determine their relation to each other. The child destroys its mechanical toys so that it may ascertain what makes the wheels go round. The youth with his first motor boat is never satisfied until he has disassembled his "one lugger," exhaustively examined the carburetor and the electric system and satisfied himself as to the duty of every part. . . . The anatomist dismembers an animal body to gain comprehensive information as to its several diverse functions. The astronomer captures the rays of the sun in the solar spectrum and divides them into their chemical constituents.

Man knows he will never acquire true knowledge except through analysis. . . .

Analyzing is the most fascinating of all practical mental pursuits. . . .

There is no principle of scientific administration which does not require the application of analysis. . . .

It is the function of analysis to make involved and complex things simple and within the scope of ordinary understanding. . . .

It is necessary, therefore, in a business, if a perfect comprehension of its activities is to be attained, that it be studied constantly through analyzation in unitary form.—FRED W. SHIBLEY, in "The New Way to Net Profits," (Harpers).

The one who is responsible for the planning of profits, whether the president of the company or a delegated associate (preferably the controller), is in the same position as the surveyor who is to prepare the way for a bridge across a stream, as the architect who is about to design an office building, or as the engineer who is to prepare plans for

PROFIT ENGINEERING

a new machine. Even a sewer is not dug without definite plans of some sort. Furthermore, he knows that in each instance the scientific approach is used, engineering principles observed, and the work to be done reduced to drawings, charts, and specifications.

Should the engineering of profits differ from the engineering of anything else? He decides, therefore, to make a layout of, and a chart for, the "profit course" of his company, in a manner acceptable to engineering demands.

It is the aim of the chapter to treat of the principles underlying, and the technique of making, this profit course chart—known as the Knoeppel Profitgraph (see frontispiece).

PURPOSE OF THE PROFITGRAPH

Regarding the purpose of this form of charting, and its usefulness to the business executive, let us consider the case of the automobile driver. He must operate his machine while it is in motion, whether traveling at 20 or 40 or 80 miles per hour. He must be aware at all times of the external conditions—cars coming toward him, cars trying to pass him, cars traveling on the cross roads. He must also control the internal factors—clutch, brake, accelerator, and steering wheel, while watching the various gauges on the instrument board. His *awareness* of external conditions and *control* of internal factors are not separate and distinct things. He must synchronize awareness and control to attain his purpose—to arrive at his destination, at the appointed time, without accident. In short, he must consider all things in connection with driving his car, as an entirety, *a unit*, each factor having a bearing on the ultimate result, each being relative to all of the others.

The same is true of the airplane pilot and the captain of the ocean vessel. They must direct their ships while moving, always "seeing things whole," to the end that the results will be as planned.

The case is no different when it comes to the business executive. His business is *not* a static thing. It is a "moving" entity—influenced by both internal and external conditions.

THE "PROFITGRAPH"

His operation of the business machine must at all times be with reference to these conditions if the goal he is desirous of attaining—the making of regular and adequate profits—is to be realized. If he ignores one set of conditions while watching the others or fails to watch each carefully enough, the result is likely to be, and many times is, a business wreck.

Anything, therefore, that will aid the executive to be comprehensive, to take the "over-all" viewpoint, and to operate the business machine while it is moving in one direction or another, so that he can relate all internal and external factors to a given end, is something that can be of extreme value to him. This is the function of the Profitgraph.

WHAT THE PROFITGRAPH IS

The income statement is unquestionably the most vital record in a business, bringing together three most important elements—sales, costs, and profits. It stands as the clearing house for information from all cost and sales records, to the surplus account on the balance sheet.

But, whether an income statement reflects an actual result monthly or yearly, or a budgeted expectation, it is, in the last analysis, only a "snapshot," a still picture, of the business situation at and for the time it was made.

Over a period of years we know that these "photographs" of business operations vary considerably. This is so in many cases even within a given year. With rise in volume there are larger profits, until we ride into what the economists call the "law of diminishing return." As volume falls, profits grow less, then reach the vanishing point, and finally become losses.

If, therefore, it was possible to employ an imaginary motion picture camera, with which to make pictures of income statements—both actual and budgeted—as they would look for any rise or fall in volume, what are now static records would become dynamic indeed.

Imagine the effect in the way of planning for profit, in running the "reel" through a projecting machine—slowly back and forth—so as to note the difference in results up and down a capacity scale from zero to 100 per cent—first

PROFIT ENGINEERING

the actual picture, then the budgeted one. The result would be a "variable income statement." This is what the Profit-graph is.

EXPLANATION OF SCALES

A word of explanation is in order at this point, with reference to the plotting of values on the Profitgraph. Up the side is the dollar scale, from zero to X dollars. Across the top is the scale that is preferred, as we are dealing with income statements, the scale of sales capacity in percentage, from zero to 100 per cent practical sales capacity. This can be extended to 150 per cent, if desired, to show the excess capacity beyond the 100 per cent point.

At any intersection on cross-sectional paper (and arithmetical paper is recommended), the readings are in terms of dollars of sales, costs, and profits (reading across), at any percentage of sales capacity (reading up).

It may be desired to make dollar readings in terms of units of some kind—such as tons (steel and coal industries), gallons (milk and oil industries), thousand squares (roofing industry), per one hundred pounds (foundries), number of workers or hours of labor (as in shipbuilding). This can be a scale independent of the sales-capacity scale, or they can be related so as to read dollars against both, as shown in frontispiece.

THE GENESIS OF THE PROFITGRAPH

To go back to the genesis of this chart, in so far as the author's use of it is concerned, and to give credit where credit is due for the original inspiration, let me say that in the fall of 1904 while working on the drawing board in the employ of the Kingsford Starch Company (now part of Corn Products Company), Oswego, N. Y., he was attracted to a shelf of magazines—*The Engineering Magazine* (later *Industrial Management*, and now a part of *Factory and Industrial Management*). In the April, May, and June issues of that year there was a series of articles by Henry Hess (of ball-bearing fame), in which he made an exhaus-

THE "PROFITGRAPH"

tive analysis of the outstanding wage-payment methods of the time, from the viewpoint of (1) the workman, (2) the employer, and (3) of invested capital. These articles were profusely illustrated with charts, one of which is reproduced at Fig. 7.

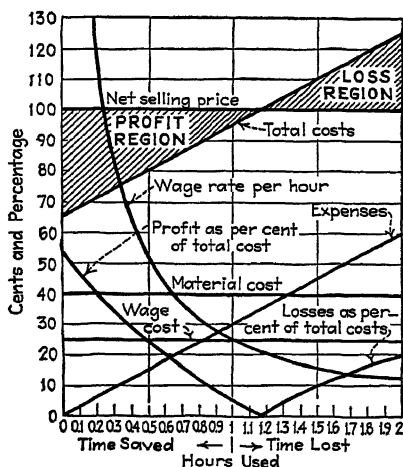


FIG. 7.

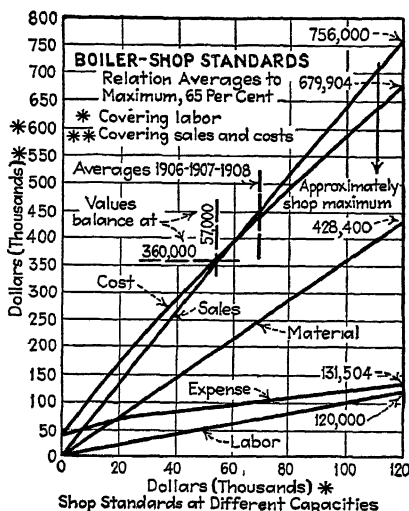


FIG. 8.

In so far as the author's knowledge of the management movement goes, this was the first "crossover" chart that was ever published—nearly twenty-nine years ago. Keep in mind, however, that Hess was analyzing wage-payment methods, and that he started his expense cost line at zero.

In 1908–1909, the author was employed professionally by Struthers-Wells Company, Warren, Pa., to install betterment methods in their plants, the largest of which was a boiler shop. One of the problems was to determine "normal" capacity, so as to standardize the overhead costs on the basis of this normal, in order to carry overabsorbed and underabsorbed overheads through an Adjustment Account and then into Profit and Loss Account at the end of the year. It was also desired to ascertain maximum capacity and the relation of a past period of years average to it.

The charting of Hess came to mind, but, in building up the expense cost, recognition was given to the fact that certain costs are "fixed" costs regardless of the rise and fall in volume. The net result was the rather crude crossover chart made in 1909, covering the boiler shop as an entirety, which is reproduced in Fig. 8. The text in "Graphic Production Control," where the chart was first published (page 378), which accompanied the charting, is as follows:

Figure 140 illustrates the manner of showing graphically a business as a whole, so as to be able to tell where losses end and profits begin. There are naturally some costs which must be met, whether there is any work done or not. In other words, cost does not begin at zero, but at a point which represents fixed expenses whether the plant operates or not. When goods are being produced, costs are plotted from this point. By plotting sales from zero, the cost and sales lines will cross at some point, to the left of which there will be losses, and to the right, profits. By plotting actual figures and capacity against these lines some valuable information can be secured.¹

It will be interesting to note that the 1909 chart carries the cyclical average covering 1906, 1907, 1908, while the one published twenty-one years later, in the April, 1930, issue of *Factory and Industrial Management*, shows the cyclical average for 1927, 1928, 1929.

That this chart played its part in the results secured for this company will be seen from the statement that, for the four years (1905, 1906, 1907, 1908) prior to the introduction of betterment methods, losses amounted to 2 per cent yearly on the capitalization; while for the eight years 1909 to 1916 the *profits* averaged 12 per cent yearly on the capitalization.

Incidentally, what started the author on the long trail culminating in the writing of this book was a conference with the sales manager of the firm in question, who wanted some help in the matter of determining what prices to charge for products when the plant operated above or below what might be called an "average" capacity.

In this connection, the author does not claim to be the discoverer of this method of charting—the credit must go

¹ Par. 807, p. 376.

THE "PROFITGRAPH"

to Euclid and Descartes for their part in the development of that branch of mathematics known as "analytical geometry."

PRINCIPLE UNDERLYING THE PROFITGRAPH

At first glance, the chart shown in frontispiece will appear to be too complicated to be understood easily. This is due to the fact that it is a composite chart, bringing together in one place a number of pertinent and related facts, all of which have a bearing on the executive's task of piloting the business machine while it is moving up or down in volume.

For the moment, therefore, we shall not attempt to explain it as an entirety. What will be attempted will be an analysis, step by step, of the essential elements, starting with the underlying principle. The simplicity and comprehensiveness of the process will be apparent later in the book treatment.

Regarding this principle, it can be said that if all costs in a business were "variable" costs, and the situation was an economic one in which there were profits, the sales and costs lines would look like those shown in Chart A (Fig. 9), and profits would show all the way from zero to 100 per cent sales capacity.

All costs, however, are not variable costs. They are of three kinds:

1. Fixed costs, like taxes, insurance, depreciation, and watchman, which remain at a given point regardless of sales volume and are known as "shutdown" costs.

2. Variable costs, like commissions to salesmen, indirect labor, bad-debt losses, direct costs like labor and material, and workmen's compensation insurance, which rise and fall with increase or decrease in sales volume.

3. Costs known as *F-V* costs, which have in them elements which are partly fixed and partly variable, such as advertising, foremanship, clerical costs, executive salaries, and supplies. Such costs have in them a proportion of fixed costs necessary to maintain a minimum organization on a "going" basis, and which remain fixed regardless of sales volume. These are the "nucleus" fixed costs. These costs also have in them parts that vary with sales volume, which may rise in proportion

PROFIT ENGINEERING

to sales volume, or faster or slower, depending upon the nature of the particular costs.

By adding "shutdown" costs at 1 to the "nucleus" costs at 3, we then have a total fixed cost. By superimposing this fixed-cost area on that of the variable costs, such as mentioned at 2 and 3, we have the result shown in Chart B (Fig. 9).

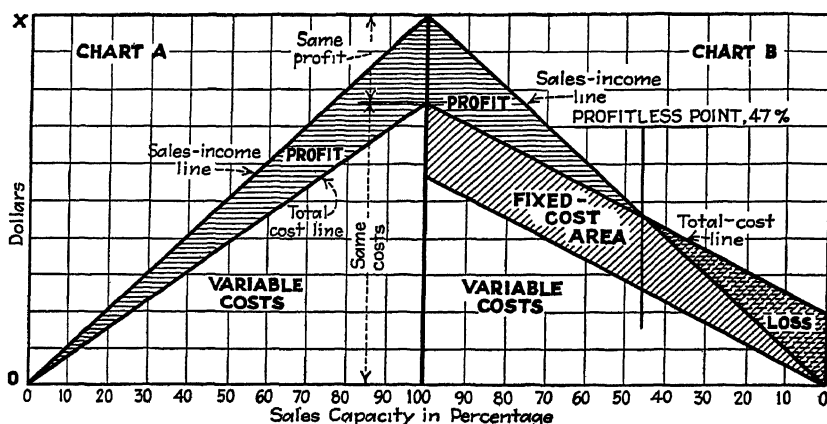


FIG. 9.—Charts illustrating influence of fixed costs on profits.

With reference to the figure in question, with the two charts back to back, it will be seen that the profit and cost areas are the same at 100 per cent of capacity, although in Chart A all is profit, while in Chart B we have profit and loss.

In other words, while the sales-income line begins at zero and crosses the 100 per cent capacity line at some point, the cost line does not begin at zero, but at a point above zero where the fixed costs end, and crosses the 100 per cent capacity line at some point below the sales-income line. At some point up the capacity scale these sales and cost lines intersect. Below this point losses are sustained, while above it profits are made. This point of crossover, or point where there are no profits, is called the *profitless point* in this profit engineering technique. The reading from the frontispiece shows this point to be at the 35 per cent point.

THE "PROFITGRAPH"

The important thing to keep in mind is that it was the fixed costs which caused the crossover of sales and costs lines. As mathematical support of this contention, we show the formula for determining the profitless point, using arbitrary figures to illustrate its use, as follows:

$$\left(\frac{\text{Fixed costs}}{\text{Fixed costs plus profits at budget}} \right) \times \frac{\text{percentage of sales}}{\text{capacity at budget}} = \frac{\text{profitless}}{\text{point}}$$

Illustration:

$$\left(\frac{\$50,000}{\$50,000 + \$25,000} \right) \times 72\% = 48 \text{ per cent}$$

In this connection, it might be well to state that, in an efficient business, this point should be between 25 and 40 per cent of capacity—an area known as the "economic crossover range."

100 PER CENT SALES CAPACITY

Mention should be made at this point of what is meant by the designation, on the 100 per cent line, "practical sales capacity." Obviously, if we are to relate all the points indicated on the Profitgraph to some standard, it is important to know what the standard is or the relationships mean nothing.

What this 100 per cent does not mean is the fullest use at all times of all manufacturing facilities at 100 per cent efficiency. This would be an *ideal* 100 per cent capacity and therefore impossible of regular accomplishment. Nor does it mean full sales capacity from the standpoint of the sales department getting all of the "breaks" and operating at 100 per cent efficiency all of the time. Such a standard would not be practical. What is meant by 100 per cent practical sales capacity does not mean what a management might wish for as a sales goal.

It really means a reasonably attainable performance, calling for high efficiency, and taking into consideration past performance, future plans, rate of growth, and a con-

sideration of potential markets. It would mean one's fair share of a given volume in an industry. It would mean that the 100 per cent sales capacity as used in this technique is what a business should be expected to "put into practice," as, generally speaking, *the mean between the average and the best sales performance over a period of years.*

The basis for this latter thought covering practical sales capacity goes back to the author's early experience in the determination of standard times for operations and workmen and is taken from his "Graphic Production Control" (page 264) as follows:

What I offer may be contrary to what experience has taught others who are making a specialty of time-study work. A man must, however, be governed largely by his own experience, and this has taught me

A. That it would be decidedly unfair to ask a man to perform a task in the *best time* shown by properly made studies.

B. That it would be decidedly unfair to the company to ask a man to perform a task in the *average time* shown by properly made studies.

In my own practice I have used a rule for determining a fair standard, as follows: *A fair standard is approximately one-half the difference between the best time recorded and the average time of the readings, added to the best time or deducted from the average time* which means, in a more simple way, the average of the average and best times.

A man can walk a mile at the rate of five miles per hour—a mile every twelve minutes—but it would be a difficult pace to steadily maintain, hour after hour. He could easily walk at the rate of three miles per hour—or a mile every twenty minutes—at what might be termed an "average" gait. A fair standard, as 100 per cent practical attainment hour after hour, would be four miles per hour—a mile every fifteen minutes. As with work and walking, so it might be regarding sales performance.

CYCLICAL "NORMAL" CAPACITY

In the case reciting the genesis of the Profitgraph, it was mentioned that what started the author at work on the development ending in the crude chart used at the time was a conference with the sales manager of the concern in question.

THE "PROFITGRAPH"

The author was at work on production and cost betterments and, in the course of his work, was asked by this sales manager if anything was to be done in connection with his department. The reply was in the negative, the reason being given that the author's experience did not cover the sales side of business. The sales manager seemed desirous of discussing his difficulties and so was encouraged to tell his story.

He began by saying that when the business operated below a fair volume of business, the cost estimates were so high that when he added a fair profit to costs, the resulting price was so far out of bounds as to mean risking loss of orders if bids were made from the figures submitted. The result was that he ignored the prices as calculated and used his own judgment regarding what he could get for his products. On the other hand, when the plant was operated on the basis of overtime and night work, as was often the case, the cost estimates were so low that when he added profit he had a price lower than he knew he could get for his goods, so again he ignored the estimates and used his own judgment in making bids.

Then he said, "There is only one time when the cost estimates can be relied upon in setting prices and that is when our business is operating on a basis that represents an average use of our plant, as this enables us to compete on even terms with others in our line. For this reason I use my own judgment in pricing when our estimates are high on a low volume of business, and low on a high volume."

What this sales manager was really doing was pricing on what we subsequently called a "normal" basis, on an average of good years and bad—a cyclical "mean" covering economic conditions over a period of short or long cycles.

It was this conference which led to the charting now called the Profitgraph, to the determination of the normal point in a business, to the standardization of overheads on the basis of this normal, and later to presentation of this principle in testimony before the Federal Trade Commission hearing, previously referred to:

PROFIT ENGINEERING

PRINCIPLE 4. POSSIBLE CAPACITY VS. EMPLOYED CAPACITY

The proportion of overhead expenses or "burden" in a department of a business, to assess against the production of that department, varies in the ratio of the capacity actually employed on production, to the possible production that could be employed, under normal conditions, the difference to be carried monthly, into a departmental "Burden-adjustment Account," and closed into "profit and loss," at the end of the year.

This "cyclical 'normal' line" is shown on frontispiece at 67 per cent of capacity. Prices for products would also be set on the basis of this normal. At this point, standard overhead rates would be set for costing purposes. Below this point there are underabsorbed overhead expenses, while above it expenses are overabsorbed.

As justification for this 67 per cent as normal, Harrington Emerson long contended that average efficiency was about 67 per cent of a fair standard, which means that a 50 per cent increase in efficiency is a reasonable expectation. Churchill, in his admirable book "Pricing for Profit" (Macmillan), calls 67 per cent the "economic normal." The author's experience checks with the contentions of Emerson and Churchill. What this means in a practical way can be seen from this illustration:

1. 100 % practical sales capacity.....	\$1,000,000
2. Ideal or best or full capacity.....	1,333,333
3. Normal or average capacity.....	666,667

or;

- 1 plus or minus $33\frac{1}{3}\%$ equals 2 or 3
- 2 minus \$333,333 equals 1
- 2 minus \$666,667 equals 3
- 3 plus 50 % equals 1
- 3 plus 100 % equals 2

THE BUDGET POINT

More and more businesses are being operated on the basis of a budget of their affairs, and the author's feeling is that, in time, every business will have to budget or make

THE "PROFITGRAPH"

less in profits than would otherwise be the case. In fact, it is felt that the time is rapidly approaching when the banking world will insist that a business applying for a line of credit, or seeking an underwriting, will have to show both a "progressive" budget and a statement (or Profitgraph) showing the relation of actual results to it.

Since the Profitgraph is essentially a *graphic master budget*, for a year or shorter period, with each 1 per cent of capacity having its own particular budget, the budget line shown on frontispiece at 75 per cent of capacity represents but *one* budget—the "fixed" budget—with areas showing the various divisions of what is now generally known as the "sales dollar." As a fixed budget it represents goal and target, toward the attainment of which everyone in an organization should work, but, as will be seen in the next chapter, to work without adjusting this budget to meet changing conditions is fallacious. The scientific budget is a *variable* budget.

THE DEADLINE IN A BUSINESS

For years the industrial world has debated whether interest on investment is an addition to costs or a deduction from profits. In this connection the author again presents this principle, stated in a previous chapter:

PRINCIPLE 6. INTEREST ON INVESTMENT

Costs of operation should not have included in them any charge covering interest on investment, as this would serve to anticipate earnings, through including a profit before it was made. No profits can be made in a business until products are sold. What is actually put in a business is the investment. What is actually earned is the interest or return on the investment.

The author's contention today is that, while interest on investment is not an addition to cost or a direct deduction from profits, it is something to which we must give real consideration in our profit-planning calculations.

In other words, a business should be profitable, at least to the extent of earning a going rate of interest as surplus profit on the invested capital of the owners (invested capital

being considered as the "net worth" and not a figure which has funded debt included in it). It can be said that a business does not justify its existence, nor its management its retention, if it cannot earn this going rate as the return for money "as money," for if the net worth could be invested in good stocks and bonds it is fair to assume that, with proper diversification and watching, an average return of 6 per cent could be earned annually on this capital investment.

It is only when a business does better than make this interest rate for capital that we can say there is a real profit, as the management reward for skill, ability, and experience, and the owner's compensation over what he could earn in stocks and bonds for the risks involved. The one is the return for money; the other is the *true business profit*.

Looking at it in this way, we can say that, at some point up the capacity scale on the Profitgraph, there is surplus profit equivalent to this going return on the investment known as net worth, or where surplus profit in sales income equals 6 per cent (stated as 6 per cent more for convenience than statistical accuracy) on the net worth as capital investment, beyond which point the business earns profit as a business.

This is the point known in this technique of profit engineering as the *deadline*, below which sales in a business should not be allowed to fall. On frontispiece this deadline is at 60 per cent of capacity.

THE EARNING REQUIREMENTS

In the previous chapter on "Calculating the Profit Requirements," the matter of a proper profit "par" was considered and methods described for calculating what a business should earn. Once determined, it is then an easy matter to place on the Profitgraph a point, covering the surplus net profit to the net worth, necessary to maintain the mean (15 per cent) requirement as a cyclical average. The spread between this point and deadline covers the "economic profit range."

THE "PROFITGRAPH"

Speaking generally, it may be said that, if the profitless point is within or in the lower part of the economic crossover range, the profit will be within the economic profit range.

OTHER POINTS ON PROFITGRAPH

In practice, there are a number of other points which can show on the Profitgraph, namely:

Where capital employed (assets) is turned once yearly.

The "retention point," where there is a proper balance between addition to surplus and amount for dividends and reserves.

Previous year's result.

The point of theoretical or ideal sales capacity, the difference between this and the 100 per cent practical sales-capacity point, as shown on profitgraph, representing excess or idle manufacturing capacity.

There are two other points on the chart of considerable importance, which will be discussed in the next chapter—the "current variable-budget indicator" and the "pivotal point."

DIVISIONS OF THE PROFIT AREA

Inasmuch as we are primarily interested in planning for profits, it is just as important to show the various profit divisions in the profit area on the Profitgraph, as it is to divide the cost area into its various divisions.

These profit divisions, generally speaking, are:

1. Excess other outgo over other income if the financial expense is greater than the financial income.¹
2. Interest on borrowed capital.
3. Income taxes.
4. Preferred dividends.
5. Common dividends.
6. Capital reserves.
7. Addition to surplus account.

VITAL STATISTICS OF A BUSINESS

When a person is not well physically, he is considered to be in an *unhealthy* state; when he becomes ill enough so that

¹ If the excess was of other income over other outgo, this excess as financial income would be superimposed on top of the sales-income line.

PROFIT ENGINEERING

his case is looked upon as serious, he is then in a *dangerous* condition; as the case gets worse, the patient reaches a time which is called the *crisis* stage. The business body can be said to possess this similarity to the human body. If it fails to earn common dividends, it is in an unhealthy condition; if it fails to earn preferred dividends, it can be said to have reached the dangerous state; if it fails to earn interest charges on borrowed capital, the business is then at the crisis point.

By noting where the lines in the profit area intersect the sales-income line, and making readings against both capacity and money scales, we can then read off the:

Crisis point—in which the banker is vitally interested, at 39.75 per cent of capacity on frontispiece.

Danger point—in which investors in preferred stock are interested, at 45 per cent on chart.

Unhealthy point—in which the owners of a business are interested, at 58.5 per cent.

PROFIT AND LOSS COLOR SCHEME

Since the Profitgraph is a graphic variable-income statement, it is important that profit and loss should be emphasized. This can easily be done through the use of different colors, as shown in frontispiece, as follows:

Red, indicating loss.

Green, indicating area from end of loss to addition to surplus account.

Yellow, indicating area in which earnings are being added to the surplus account.

UNITARY ANALYSIS

Emphasis should be made at this point that the Profitgraph is merely a chart—angles and lines and percentages and dollars—and in itself a static and useless thing, until some one takes it and uses it as he would an automobile route map. The preparatory work leading to the making of the Profitgraph is as important as that involved in preparing a road map. Even more important is the work of studying the Profitgraph and using it as a guide to a profit

THE "PROFITGRAPH"

objective, in the same way the automobile driver who has a definite destination in mind but is lost on a detour uses his map.

Keep in mind Shibley's statement used in the keynote quotation in this chapter: "It is necessary, therefore, in a business, if a perfect comprehension of its activities is to be attained, that it be studied constantly through analyzation in unitary form." The Profitgraph provides a form of "analyzation in unitary form."

CHAPTER VIII

THE "PROFITGRAPH" AS A NEW MANAGEMENT "TOOL"

When the chart was completed, it was presented to the management. While I have been with the company for a period of a little over four years, I had practically never been called to a directors' meeting, except for some special information. At the directors' meeting subsequent to the recent compilation and presentation of this chart, I was called in and asked to explain the profitgraph. When the talk was over, each one asked for a copy of the chart to keep in his own desk. It is believed that this was a case of the controller's division getting into the hearts of the executives with the use of a new tool.—E. S. LAROSE, assistant controller, Bausch & Lomb Optical Company, in "Practical Budgeting," published by National Association of Cost Accountants.

In the previous chapter we presented the Profitgraph as a "charted moving picture" of a business, graphically bringing together in one place a variety of pertinent factors related to the affairs of a concern, whether in a state of ebb or flow. The treatment was largely descriptive, however, and purposely so, in order best to prepare those interested in this important subject of profit engineering, for the trip from the "what" to the "why," then to the "how," and finally to the objective—profits. The treatment was largely about a chart—merely a chart with a number of potentialities.

Now we want to consider the Profitgraph from the standpoint of its importance as a new management tool, a mechanism of many uses in profit planning.

What the author means by the reference to the Profitgraph as a "tool" can best be presented by this personal reference: Some years ago he was forced to go to the hospital for operations and, while there, became ill with acute toxemia. His doctor used to visit him twice daily, and on

each occasion reviewed the nurses' chart. One afternoon he came in, looked over the chart, left the room in an unusual hurry, came in with the nurse, gave her a few instructions, and in an hour's time the patient was perspiring as if he had been in a Turkish bath. When asked for an explanation, the doctor replied that temperature had reached alarming proportions, and that it was essential to take steps to reduce this as quickly as he could. Was not this chart an "efficient management tool" for this doctor?

THE FALLACY OF FIXED BUDGETING

It is beginning to be clearly recognized that the fixed budget is fallacious, owing to the fact that current conditions are always different from those considered as the premises on which the budget was developed.

This principle, therefore, is advanced: "In budgeting, a variable actual result should be compared against its comparable variable budget, as it is fallacious to relate values of different denominators."

For instance, assume that a fixed budget for sales for a given month is \$100,000, and that one of the items—like salesmen's commissions—is \$10,000. Obviously, if the actual sales for the month in question are \$75,000, the budget allowance of \$10,000 is too much, because less would be spent, and it would appear that a gain had been made. A comparable budget figure would be \$7,500. On the other hand, if sales for the month rose to \$125,000, then the \$10,000 is too small, as more would be spent, making it appear that a loss had been sustained. A comparable budget figure in this case would be \$12,500.

In view of the statement of this principle, and the illustration which follows it, Charts A and B, Fig. 10, will be found illuminating. In Chart A we have the case of an increase of sales calling for more of the variable costs than allowed in the fixed budget; while in Chart B the case is that of a decrease in sales which should mean an automatic reduction in the variable-cost content.

PROFIT ENGINEERING

A fixed budget for a year or even six months is a true budget only when the average situation is in agreement with the budgeted determination. If the average situation is

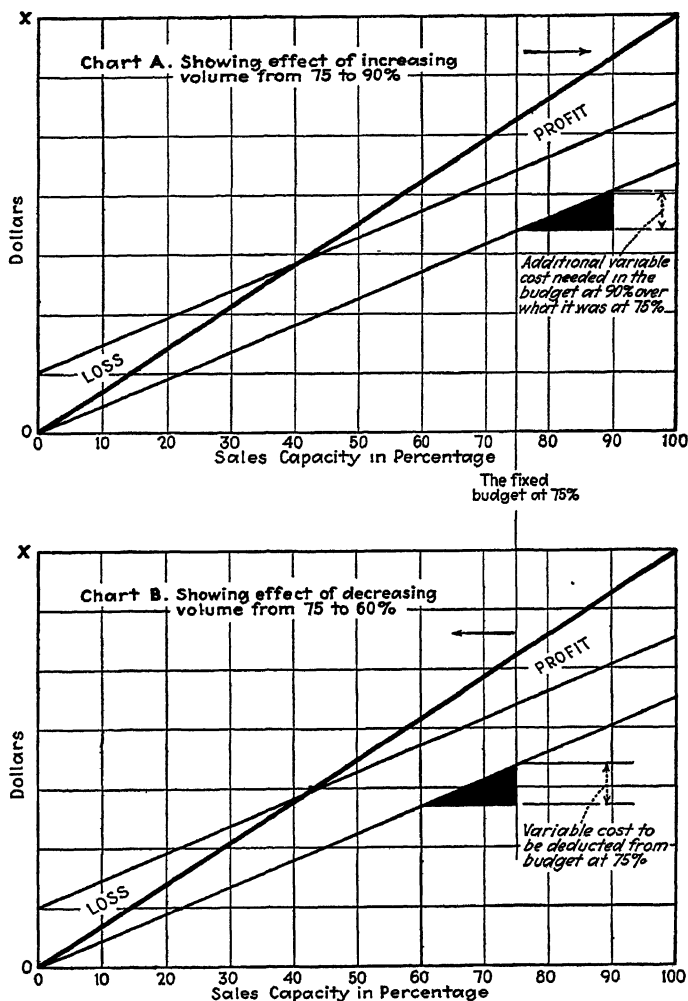


FIG. 10.—Charts illustrating fallacy of fixed budgeting.

above or below the fixed budget, then true comparisons are not possible, and a variable budget is in order. Variable budgeting is the only answer to the problem of orienting results to changes in business conditions, for about the only

thing about business that is changeless is that it never remains fixed. There should be a fixed budget, of course, but there should be variable budgets to meet the current rise and fall in business conditions.

Regarding this matter of variable budgeting, Floyd F. Hovey, Eastman Kodak Company, in a paper before the Taylor Society, on "Cost Accounting and Budget Making," said:

Every business activity is subject to fluctuations in volume. Some have pronounced seasonal variations; most businesses show a gradual long-time trend upward or downward; and nearly all are influenced by the business cycle. Budgets should be set up so that they may be easily adjusted to current changes in volume. To assist in these adjustments, the cost accountant should differentiate in his accounts between fixed and variable items of expenditure. Some items of cost are fixed regardless of production. Items like taxes, rent, and depreciation fall into this class. Other items vary with production, such as materials and direct labor. The accounts should differentiate between these elements of cost so that a budget flexible enough to apply to any production can be arrived at.

With the accounts properly classified into fixed and variable items, the cost accountant should then set up variable standard costs for fluctuating production. These costs will then determine the amount of the budgeted expenditures as soon as the budgeted output is known.

At the end of each accounting period the actual expenditures for the period should be compared with these budgeted figures *corrected for the volume of business actually done*. A statement may then be issued which will show the actual net profit and will allocate the variances to their true causes. Change in volume of business will be charged or credited with its proper share of the variance, and variance in efficiency will be charged or credited with its just amount without the complicating factor of volume variance.

Variable budgeting is the only true budgeting, as it enables us to relate an actual result against its comparable variable standard.

This comparable variable standard is shown on the Profitgraph (see frontispiece) on the 82 per cent line, as the "current variable-budget indicator," or the variable-budget point for the year-to-date showing, equated in terms of the fiscal year or twelve months' moving average, with due consideration given to seasonal swings in the fiscal year

PROFIT ENGINEERING

or twelve months. A study of the Profitgraph will show that it is an *automatic variable budget* for any percentage of capacity.

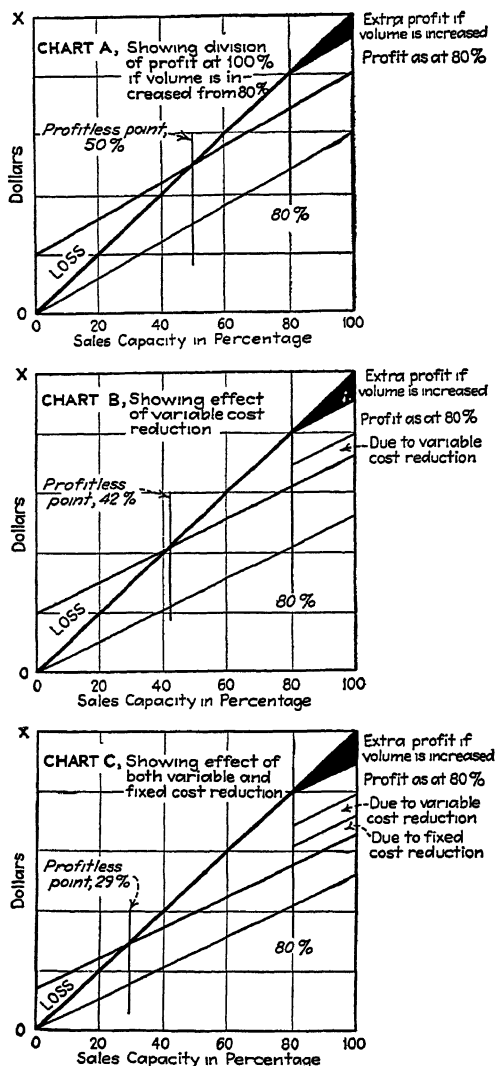


FIG. 11.—Chart illustrating sales-volume fallacy.

THE SALES-VOLUME FALLACY

As was previously stated in this book, we have worshipped the false god of sales volume, on the theory of the

proponents of this doctrine that all that was necessary to increase profits was to secure greater and still greater sales.

Figure 11 demonstrates quite conclusively that this doctrine is a fallacy. In Chart A of this group is shown the additional profit made by increasing sales from 80 to 100 per cent of capacity, the black triangle indicating what the extra profit is, which would seem to be proof of the contention of advocates of the "give-me-volume" theory.

It will be noted, however, that this increase in volume has neither widened the profit area nor lowered the profitless point on the Profitgraph, and a moment's reflection will indicate that this *widening* and *lowering* process is the secret of greater profits and the real purpose of profit budgeting.

In Chart B of Fig. 11 is shown the effect of reducing variable cost and *then* increasing volume from 80 to 100 per cent. Please note that the black triangle is now a little larger in Chart B than in Chart A. We have also widened the profit area and lowered the profitless point from 50 per cent in Chart A to 42 per cent in Chart B.

If, in addition to reducing variable costs, we could also reduce fixed costs, the results would appear as shown in Chart C, with a larger black triangle, much wider profit area, and a profitless point lowered from 42 per cent in Chart B to 29 per cent in Chart C.

If the reader will compare the cost reductions at 80 per cent on Chart B with the extra profit due to volume increase to 100 per cent on Chart A, it will be seen that they are about the same, while the area of the two cost reductions on Chart C at 80 per cent shows nearly twice the area of the extra profit at 100 per cent on Chart A.

The reason for the greater black areas in Charts B and C over the triangle in Chart A lies in the fact that the bases of these triangles are parallel with the cost lines, which drop lower in Chart B and still lower in Chart C than the cost line in Chart A.

Another principle can now be stated: "Widening the profit area and lowering the profitless point on the capacity

PROFIT ENGINEERING

scale are matters of cost reduction and/or better prices rather than sales-volume increase." This will indicate why profit engineering can promise *greater profit on less volume* than is usually thought possible.

RELATION OF FIXED COSTS TO PROFITS

In Chart C (Fig. 11) we showed what could be done if, after reducing variable costs, we could also reduce fixed costs.

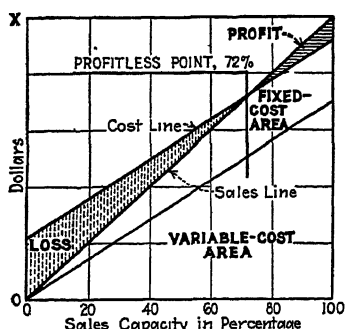


CHART A. Illustrating Effect of Both High Fixed and High Variable Costs

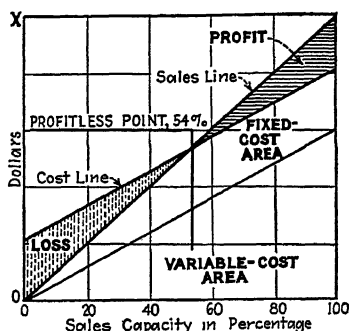


CHART B. Illustrating Effect of Low Variable and High Fixed Costs (Fixed Same as in Chart A)

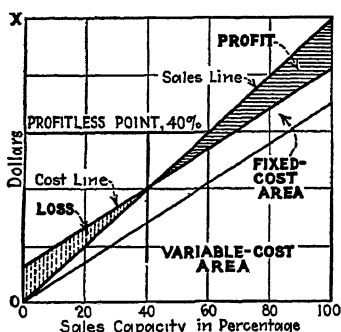


CHART C. Illustrating Effect of High Variable and Low Fixed Costs (Variable Same as in Chart A)

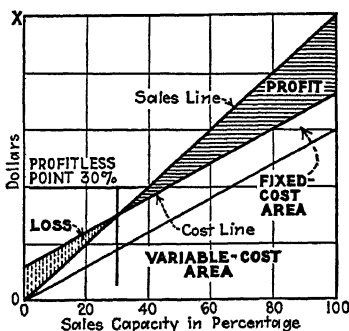


CHART D. Illustrating Effect of Both Low Fixed and Variable Costs (Fixed From Chart C, Variable From Chart B)

FIG. 12.—Charts illustrating effect of varying fixed-variable cost relationships.

In the study in this section, we want to take steps to change the "if" to "when," by calling the attention of readers to the important relation of fixed costs to profits.

Figure 12 has four charts. In Chart A we illustrate the effect of high fixed and high variable costs, resulting in a

A NEW MANAGEMENT "TOOL"

profitless point of 72 per cent. In Chart B we lower the variable cost as shown in Chart A but leave the fixed cost the same, with the profitless point now at 54 per cent. In Chart C we leave the variable costs the same as in Chart A and lower the fixed costs, with the profitless point now at 40 per cent. In Chart D we bring together the low fixed cost from Chart C and the low variable cost from Chart B, with the profitless point now at 30 per cent.

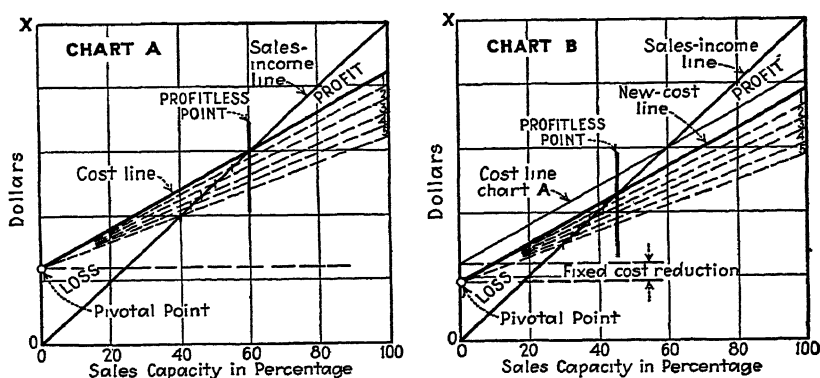


FIG. 13.—Effect of pivotal point location.

As will be seen from a study of these four charts, it is better to have a high variable cost and a low fixed cost, as in Chart C, than a low variable cost and high fixed cost as in Chart B.

In other words, what governs the width of the profit area, and the position of the profitless point on the sales-capacity scale, are:

1. *Height of the fixed cost area.*
2. *Angle of the variable cost line.*

Any scientific approach to the problem of cost reduction, therefore, must take into consideration the lowering of the *pivotal point* (see frontispiece), so as to have the line of total cost swing on a lower axis. This will be seen more clearly by referring to the two charts on Fig. 13.

This study leads to the statement of this principle: "Scientific cost reduction is a matter of considering fixed and variable costs, in the order named."

PROFIT ENGINEERING

GREATER PROFIT WITH LESS VOLUME

The statement was made that profit engineering can promise *greater* profits with less volume than is usually thought possible. In this consideration two principles were stated covering this matter of making profits more scientifically, in which fixed- and variable-cost reductions and price increase were mentioned.

Figure 14 is a graphic presentation of what is meant. In Chart A is shown a hypothetical situation, with sales at 85 per cent and profitless point at 60 per cent. In Chart B we show the threefold effect of slight reductions in fixed

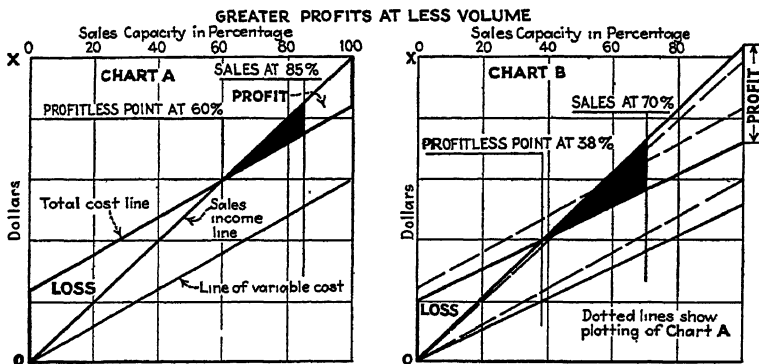


FIG. 14.

and variable costs and a small increase in the income from sales due to price betterment. On Chart B is shown the charting on A in dotted lines.

Please note that the profit shown by the black triangle on Chart B is nearly twice that shown in Chart A, despite the fact that volume has been reduced from 85 to 70 per cent, with profitless point at 38 per cent.

You may say that, while cost reductions are always difficult to make, price betterment is almost impossible to secure. There is more to this matter of pricing, however, than we usually admit, a fact which will be borne out by treatment of this subject in subsequent chapters. In the meantime, in support of the statement that most concerns

A NEW MANAGEMENT "TOOL"

do not know how to price their products, please read and study "Pricing for Profit," by W. L. Churchill (Macmillan).

SALES-DOLLAR ANALYSIS

Profit engineering employs an efficient device in what is known as the "sales-dollar analysis." By this is meant that the various components of the income statement are expressed in cents, which is a more *dynamic* way of expressing *static* percentages.

We all comprehend what a dollar is and, inasmuch as there are no more or no less than 100 cents in a dollar, we can better visualize what the income statement means when stated in terms of cents. Furthermore, any increase in one component must be compensated for decreases in others, if profits are to be made, which, of course, is the goal of budgeting for profits. The outgo—all outgo including profits—must be kept at 100 cents.

Here is a sample sales-dollar analysis:

Gross sales.....	104.20¢	
Returns and allowances and freight out...	4.20	
<i>Net sales</i>	<u>100.00¢</u>	
Material.....	31.00	
Labor.....	15.00	
Manufacturing overhead.....	17.50	
<i>Manufacturing cost of sales</i>	<u>63.50¢</u>	} Cost to make and sell— \$89.50
<i>Gross margin for commercial cost and profit.</i>	<u>36.50¢</u>	
Administrative expense.....	8.75¢	
Selling expense.....	17.25	
<i>Commercial cost of sales</i>	<u>26.00¢</u>	
<i>Operating profit</i>	10.50¢	
Excess other outgo over other income....	.50	
Business profit	<u>10.00¢</u>	
Interest borrowed capital.....	2.00	
<i>Taxable profit</i>	8.00¢	
Income tax.....	.96	
Surplus profit	<u>7.04¢</u>	
Dividends and reserves.....	6.00	
Retained profit	<u>1.04¢</u>	

The author knows of no better word painting covering this important matter of sales-dollar analysis than that

PROFIT ENGINEERING

contained in the book "The New Way to Net Profits," by Fred W. Shibley (Harpers) which we want to present at this point:

The sales dollar is the satellite of the budget. It is the yardstick employed by a management to measure, compare, and control expense.

The possibilities in budgetary control which play about the sales dollar are practically unlimited.

The sales dollar expresses each of the constituent elements of the cost of sales as a per cent of the net sales. In other words, it indicates in cents

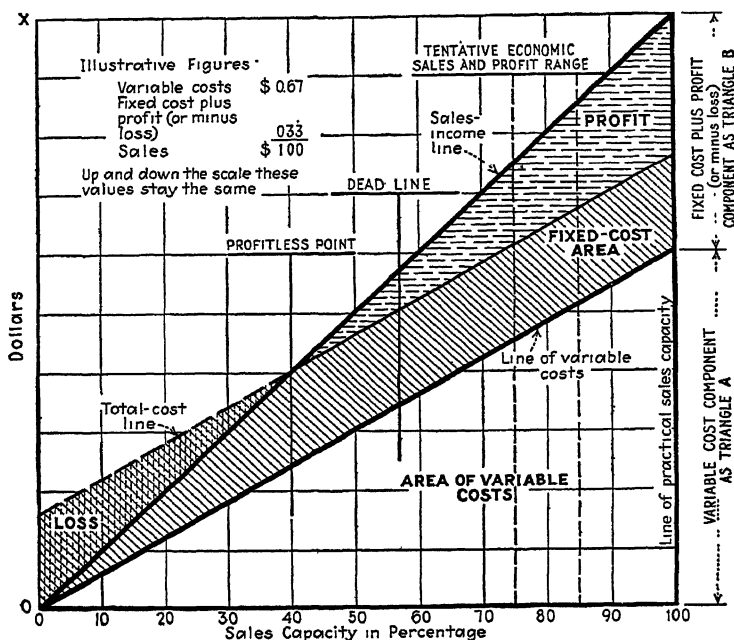


FIG. 15.—Variable components of the sales dollar.

the amount of each dollar of net sales which has been expended for account of each item of cost as above designated.

There is apparently an excellent reason why the sales dollar should be a hard taskmaster, since at its side stands always the standard or master sales dollar of the year, and under the severe terms of budgetary control, it is required that deviation in percentage from the master sales dollar shall be explained.

The sales dollar provides an exact method of subdividing the atom of costs into its electrons and putting these electrons under a powerful microscope for intimate examination. The days of small profits are

A NEW MANAGEMENT "TOOL"

drawing near, but scientific administration is moving forward faster than the decline approaches.

There is much more to this sales-dollar analysis than appears on the surface, as will be seen if we dig a little deeper into the subject.

In Fig. 15 we observe that the sales income is divided into two major *variable* components:

A. Variable-cost triangle.

B. Fixed-cost plus profit triangle.

Inasmuch as the profitgraph is a variable-income statement, and because the variable triangle *B* is made up of fixed costs plus profits (or minus losses), which elements from profitless point on the capacity scale are constantly changing their relative positions, from all fixed costs to part fixed and part profits, it can be seen that at any point up the scales capacity scale we can (1) determine the profit content or (2) on the principle of variable budgeting, determine the budget for given sales, through the use of this formula:

$$\text{Sales} - [(\text{sales} \times \text{per cent of variable costs}) + \text{fixed costs}] = \text{profit (or loss)}$$

To illustrate, let us assume these values:

Sales.....	\$1,000,000
Variable cost content.....	70 %
Fixed costs.....	\$ 200,000

Calculations:

$$\$1,000,000 - (\$1,000,000 \times 70 \% = \$700,000 + \$200,000) = \$100,000$$

Calculations:

Variable costs.....	\$ 700,000
Fixed costs.....	200,000
Profit.....	100,000
<hr/>	
Sales.....	\$1,000,000

We can go further and ascertain the sales volume necessary to give us a required profit through the use of this formula:

$$\frac{\text{Profit desired} + \text{fixed costs}}{\text{Per cent of variability of fixed costs and profits}} = \text{sales needed}$$

PROFIT ENGINEERING

To illustrate, let us assume these values:

Profit desired...	\$200,000
Fixed costs...	200,000
Fixed costs and profit content.....	90%

Calculations:

$$\frac{\$200,000 + \$200,000}{90\%} = \$1,333,333 \text{ in sales}$$

THE ECONOMIC BUDGET POINT

Somewhere up the capacity scale on Profitgraph—and *above the deadline*—is a logical point at which sales, profits, and costs can be said to be in line, or at a point which might be called the “economic budget point,” the point where there is a proper relationship of fixed cost to profit.

As was said before, these relationships are constantly changing as volume moves up or down. In one case the calculations were as follows:

Capacity	Fixed costs, cents	Profit, cents	Constant, cents
40*	33.00	0.00	33.00
50	26.00	7.00	33.00
60	21.67	11.33	33.00
70	18.56	14.44	33.00
80	16.25	16.75	33.00
90	14.44	18.56	33.00
100	13.00	20.00	33.00

* Profitless point.

This economic budget point, assuming that capital turnover is approximately 1.0 to 1.0, should be somewhere between 70 and 85 per cent on the chart (Fig. 15), as it would be developed merely from the standpoint of the Profitgraph approach to the problem of making what might be termed a preliminary sales forecast: a tentative objective against which a more scientific sales par determination would be checked.

Capital turnover is mentioned because profit area should be relatively wider as turnover is less than 1.0 to 1.0; and relatively less in width as turnover is greater than 1.0 to 1.0.

A NEW MANAGEMENT "TOOL"

The value of this way of helping to forecast sales and profits, from the standpoint of profit control, is evidenced by this statement by E. S. LaRose, assistant controller, Bausch & Lomb Optical Company, Rochester, N. Y., in "Practical Budgeting," published by National Association of Cost Accountants.

. . . our management found that they could not take the full business conditions break. Therefore, it would be necessary for them to beat some of this depression with new products and increased sales effort, or re-allocated sales effort in accordance with the potential market or buying power studies of the various districts and trading areas throughout the country.

The reason that our management did not set their goal in accordance with business conditions, which were estimated to show an average of 16.5 per cent below normal for 1931, is because they were looking at the profitgraph, figure four. This chart told them the amount of business which had to be obtained. . . .

It might be mentioned here that, at the end of five months, our 1931 sales were within three-tenths of 1 per cent of the budget, adjusted for tilted allowance. Thereafter practically the entire further decline, since October, 1930, was beaten. . . .

Significant, in this connection, are the fixed costs and profits relationships in the Bausch & Lomb case, as taken from the Profitgraph to which Mr. LaRose refers. They are:

1931 crossover at 36 per cent; deadline at 65 per cent; budget at 71 per cent.

The relationships on the 71 per cent line are:

Item	Cents of sales dollar	Percentage
Profit.....	10.8	49.09
Fixed cost.....	11.2	50.91
Total.....	22.0	100.00

THE PROFITGRAPH AS AN IDEAL INCOME STATEMENT

The Profitgraph, as developed, constitutes an "ideal income statement," because, in line with the philosophy

PROFIT ENGINEERING

advanced of deducting profits from sales income and then "living within the balance," we start with sales, subtract the profits, then the fixed costs, then the variable costs, and finally the direct costs.

This is why the Profitgraph is such a valuable management tool. In addition to its being a variable-income statement of a graphic nature and on a budgeted basis, *it is arranged in the proper order from the standpoint of profit engineering.*

Here is how one would be arranged (without figures shown):

Elements	Budget		Actual		Variations,	
	Amount	¢	Amount	¢	Amount	¢
Net sales.....						
Surplus added.....						
Reserves.....						
Preferred dividends.....						
Common dividends.....						
Income tax.....						
Interest on borrowings.....						
Excess other outgo.....						
Operating profit.....						
Balance for costs.....						
Fixed manufacturing expense....						
Fixed administration expense....						
Fixed selling expense.....						
Fixed expenses.....						
Balance for variable costs.....						
Variable manufacturing expense...						
Variable administration expense...						
Variable selling expense.....						
Variable expenses.....						
Balance for direct costs.....						
Direct labor.....						
Direct material.....						
Direct costs.....						

WHAT THE PROFITGRAPH REALLY BECOMES

A review of the text of this and previous chapters, as well as a study of the Profitgraph, will by this time indicate both

its simplicity and comprehensiveness, as well as its value to the executive as a mechanism for enabling him to observe the direction his business is traveling while it is in motion. Thus, it becomes analogous to the "master course chart" of the captain of the ocean vessel, on which he can note variations and plan accordingly.

In more concrete language, this chart, in the case of a budgeted situation, really becomes a *graphic variable budgeted income statement*, for, as will be seen upon reflection, each 1 per cent of capacity has its own budgeted income statement, as a standard against which the executive can "relate" his actual results, note variations from the profit course, and plan his campaign for needed betterments.

It may be argued that this engineering technique of profit planning has been overemphasized, yet, if one will stop to think of the care taken in applying engineering principles to the design and building of a modern power plant, in order to supply a business with power—which business is in the business of making profits as the final result—the contention falls of its own dead weight.

What the late Knute Rockne thought of control in football was well stated by him in "Sales Management," as follows:

Out at Notre Dame we have our "control plan"—only we call it our "chart of play." If I had to coach football without it, I would probably quit coaching. This chart tells us everything we want to know about what happened in previous games—and shows us just where we can improve on the individual performance of every man.

The Profitgraph is the "chart of play" of profit planning and control.

CHAPTER IX

BUDGETING FOR "REQUIRED" PROFITS

. . . operating budgets should be balanced. This means that income should be coaxed up, and outgo pared down, at whatever cost of thought and effort, until the two accounts overlap and leave at least a little margin of profit on the credit side.

The volume of employment will increase in proportion as individual business units so re-order their affairs as to enable them to operate at a profit. Business men can operate successfully at the new and lower price levels when once they have adjusted their operations to them.—LEONARD AYRES, in his annual forecast before the Cleveland Chamber of Commerce, December, 1931.

There is a secret gold mine in budgetary control which a select few have discovered and are mining profitably.—FRED W. SHIBLEY, in "The New Way to Net Profits" (Harpers).

There are two ways of going about this important matter of making profits in business. The first is for executives of a business to do the very best that they can during a year and then wait until January or February of the ensuing year to ascertain how much they have made or lost. The other way is to plan in advance the making of the required profits, and then to devise ways and means for knowing approximately what the fiscal year's showing will look like *before* Dec. 31 of the year in question puts in its appearance. The one is a postmortem process; the other the antemortem. The latter is the scientific approach to the problem of profit making, the keystone of which is profit planning. And the keystone of profit planning, in turn, is *variable budgeting*.

SOME GENERAL ASPECTS OF BUDGETING

Every responsible executive in an organization (including foremen and salesmen) gives considerable thought to futures during the course of a year; but in an unbudgeted business where things are done more or less on the basis

BUDGETING FOR "REQUIRED" PROFITS

of past and present happenings, thinking about futures is not recorded, analyzed, and utilized in anything like the degree that is possible. When planning is done it is of the accidental, hit-and-miss variety.

Budgeting emphasizes the importance of futures. The past has gone and cannot be changed in the slightest degree. The only virtue of past results is their value in determining trends and tendencies, which may or may not be in line with future happenings. The present is only valuable in determining current actual results which can be used for comparison with results *as they should be*. What should be done, when discovered accidentally or under pressure, cannot as a rule affect present results to any marked degree, owing to the fact that, generally speaking, time does not allow for sudden major shifts in plans. It is, of course, true that tomorrow never arrives, yet, to the degree that we can foretell what the tomorrows hold in store for us, will we better our present results.

It is our conception about futures, our thinking concerning futures, our prophesies regarding futures, that govern the present—and not the past. If, therefore, we can find a way in business to do two things:

1. Find out and record what executives think about futures.
2. Get them to think more and more intelligently about the business tomorrows.

Then, through a proper budget organization, we can analyze these conclusions, coordinate them, and use the resulting conclusions in reaching intelligent decisions regarding steps to take in the future.

A budget figure—any budget figure—is an expression in terms of units of measurement or value, or both, of what executives have thought in the past about the future against which the present is compared. The degree of difference between planned performance and actual result is simply the degree by which these executives have succeeded in anticipating or failed to anticipate the future. In brief, budgeting is the work necessary in harnessing the thinking

powers (potential and actual) of executives in terms of future expectations, and then focusing this mental power—for a completed budget is merely a mental composite—with reference to definite targets.

At first this thinking will be uncertain, spasmodic, and rambling in nature, for to be suddenly cut away from absolute reliance on past and present happenings and attempt to plumb the seemingly uncertain, indefinite, and intangible future is, for most people, like sailing an uncharted sea.

As time passes, however, and executives get the spirit of the thing (and the “spirit” of it is vital), observe the comparisons of actual results against budgeted anticipations, see their own results in contrast to those of others, and give more and more thought to futures, this thinking will become more scientific and consequently more result producing.

Budgeting should be developed from two angles:

1. Gather the essential facts about past and present operations, so as to anticipate the future, as if there were no future influences to disturb or change these anticipations.

2. Take steps to bring the future to you through economic research, so as to ascertain what your own trained thinkers—and especially the outside agencies of a competent nature—have to say about expectations, which can be used to modify and correct what you would otherwise see through the eyes merely of the past and present.

Out of it all will come budgeting, budgeting for profits, budgeting which can mean “profit assurance.”

This kind of budgeting and the lack of it are well illustrated by this excerpt from an article in the August, 1927, issue of *Management*, as follows:

The Procter and Gamble Company lost over thirty million dollars in inventory declines during that period and have now rearranged their organization plans so that they are automatically protected. Decisions and policies are reviewed by means of a careful system of checks which do not take away initiative but provide a better basis than ever of fact and cross-analysis by conference and committee.

In 1931, this company made *more* profit on *less* sales than in 1930.

BUDGETING FOR "REQUIRED" PROFITS

In another case, that of one of the largest companies in a certain line, the management was confronted, right after the World War, with the problem of futures. It decided to do something more than guess. Plant capacities were considered; interest and dividend requirements were calculated; effect on cost of operating at different points below capacity was given attention; overheads at different productions were figured; volume of sales to run at some point near normal was developed; factor of safety to add to advertising and selling costs to get business in a declining market was calculated; and many other things were taken into consideration. This business has been a noteworthy success ever since.

BUDGETING AS BASIS OF PROFIT PLANNING

The word "budget" has a variety of meanings:

A sack with its contents.

A compact collection of things.

A collection of news.

Any detailed report by a financial agent.

The annual statement made to parliament by the Chancellor of the Exchequer.

A plan of affairs.

Of these six meanings there is only one which fits our requirements—that of the budget as "a plan of affairs"—analogous to the plans of a military general covering a campaign about to be undertaken, or in terms of the drawings and specifications of architect and contractor covering the erection of an office building.

Based on this meaning, and keeping profits in mind, we can now define budgeting as: "The art of (1) determining, (2) planning, and then (3) controlling the making of the *required* excess of the *needed* income from sales over the cost outgo."

This kind of budgeting calls for a change in the usual sales and profit formula:

Sales — (labor + material + overhead) = profit (????)
to a new one, with all elements under budget control:

PROFIT ENGINEERING

$$\text{Sales} - (\text{profit} + \text{fixed costs}) - (\text{labor} + \text{material} + \text{"variable" overhead}) = \text{zero}$$

Profit assurance, through the right kind of budgeting in the hands of an efficient organization, calls for a technique analogous to that mentioned by Alfred P. Sloan, Jr. in the General Motors case material, presented in the chapter "Profit Planning Analogous to Production Planning."

PRESENT ACTUAL RESULTS

Let us assume for the purpose of this discussion that, in a given business, the management is unfamiliar with the technique of profit engineering so far referred to in this book, that it has no budgetary control system in the sense of the term used herein, but that it is the desire of this management to take such steps as will ultimately mean "Profitgraphed planning."

The obvious first step for such a management to take would be to appraise the current actual situation, on the premise that one must know what a given result is before steps can be taken to better it. In other words, the question is, "What are we doing now?" It should then make a Profitgraph of the business on the basis of the actual results for the current twelve-month period.

To do this, the first work would be to divide all costs into the three classes mentioned in Chap. VII, section on "Principle underlying the profitgraph," as fixed, variable, and "fixed variable" so that a build-up of costs into the two divisions—fixed and variable—can be made. This build-up should be with reference to detailed items. On a work sheet (see Fig. 16) the various items should be listed as indicated, which would mean a series of income statements covering present actual conditions. The three statements shown are at current average sales, estimated-sales budget, and 100 per cent practical sales capacity.

In preparing to make the Profitgraph, add together cumulatively the various total costs, starting with direct materials, *and plot totals only*, thus avoiding inaccuracies which would creep in if individual amounts were charted.

BUDGETING FOR "REQUIRED" PROFITS

ANALYSIS OF SALES INCOME AS TO FIXED AND VARIABLE ITEMS

Division can be made by 5 or 10
per cent increments if desired

Current
twelve months

Arranged in order
of "Profitgraphing"

Item	Sales capacity, per cent					
	40 per cent		80 per cent		100 per cent	
	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar
	Average sales		Estimated sales		Practical capacity	
<i>Net sales income</i>	\$2,000,000	100.00	\$4,000,000	100.00	\$5,000,000	100.00
Direct material	\$ 600,000	30.00	\$1,200,000	30.00	\$1,500,000	30.00
Direct labor.....	300,000	15.00	600,000	15.00	750,000	15.00
<i>Direct cost</i>	\$ 900,000	45.00	\$1,800,000	45.00	\$2,250,000	45.00
Variable manufacturing expense (list items).....	\$ 260,000	13.00	\$ 520,000	13.00	650,000	13.00
Variable administrative expense (list items).....	100,000	5.00	200,000	5.00	250,000	5.00
Variable selling expense (list items)	260,000	13.00	520,000	13.00	650,000	13.00
<i>Total variable expense</i>	\$ 620,000	31.00	\$1,240,000	31.00	\$1,550,000	31.00
<i>Grand total variable costs</i>	\$1,520,000	76.00	\$3,040,000	76.00	\$3,800,000	76.00
Fixed manufacturing expense (list items).....	\$ 250,000	12.50	\$ 250,000	6.25	\$ 250,000	5.00
Fixed administrative expense (list items)	200,000	10.00	200,000	5.00	200,000	4.00
Fixed selling expense (list items)...	350,000	17.50	350,000	8.75	350,000	7.00
<i>Total fixed expenses</i>	\$ 800,000	40.00	\$ 800,000	20.00	\$ 800,000	16.00
Operating profit.....	\$20,000	1.00	160,000	4.00	400,000	8.00
Fixed costs and profits.....	480,000	24.00	960,000	24.00	1,200,000	24.00
<i>Total (net sales)</i>	\$2,000,000	100.00	\$4,000,000	100.00	\$5,000,000	100.00
Division of profits:						
Operating profit.....	\$ 320,000	16.00	\$ 160,000	4.00	\$ 400,000	8.00
Excess other outgo.....	10,000	.50	45,000	1.125	60,000	1.20
Net business profit.....	\$ 330,000	16.50	\$ 115,000	2.875	\$ 340,000	6.80
Interest borrowed capital.....	80,000	4.00	80,000	2.000	80,000	1.60
Taxable profit.....	\$ 410,000	20.50	\$ 35,000	0.875	\$ 260,000	5.20
Income tax.....			4,200	0.105	31,200	0.62
<i>Surplus profit</i>	\$ 410,000	20.50	\$ 30,800	0.770	\$ 228,800	4.58
Dividends and reserves:						
Preferred.....			\$ 50,000	1.25	\$ 50,000	1.00
Common.....					50,000	1.00
Reserves.....						
<i>Total</i>			\$ 50,000	1.25	\$ 100,000	2.00
<i>RETAINED PROFIT</i>	\$ 410,000	20.50	\$ 19,200	0.48	\$ 128,800	2.58

FIG. 16.

PROGRESSIVE STEPS IN MAKING A KNOEPEL PROFITGRAPH

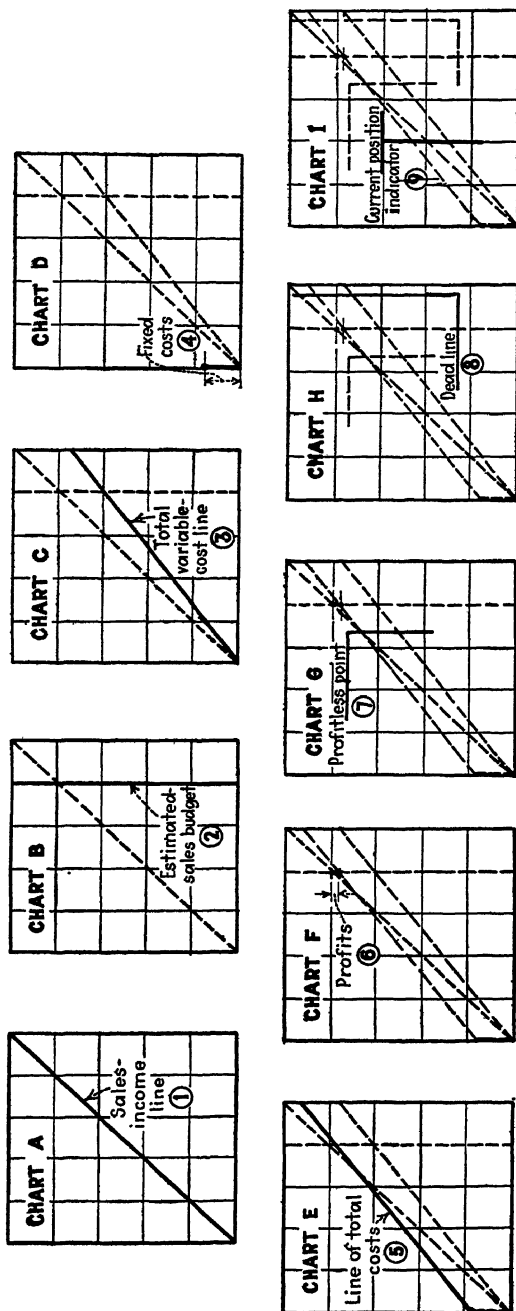


Fig. 17.

BUDGETING FOR "REQUIRED" PROFITS

PROGRESSIVE STEPS IN MAKING PROFITGRAPH

Because the making of a Profitgraph is looked upon as a difficult task owing to the erroneous assumption that the chart is a complicated mechanism, the aim of the author has been to indicate its simplicity and comprehensiveness, by presenting a progressive order of preparation, as shown in Fig. 17.

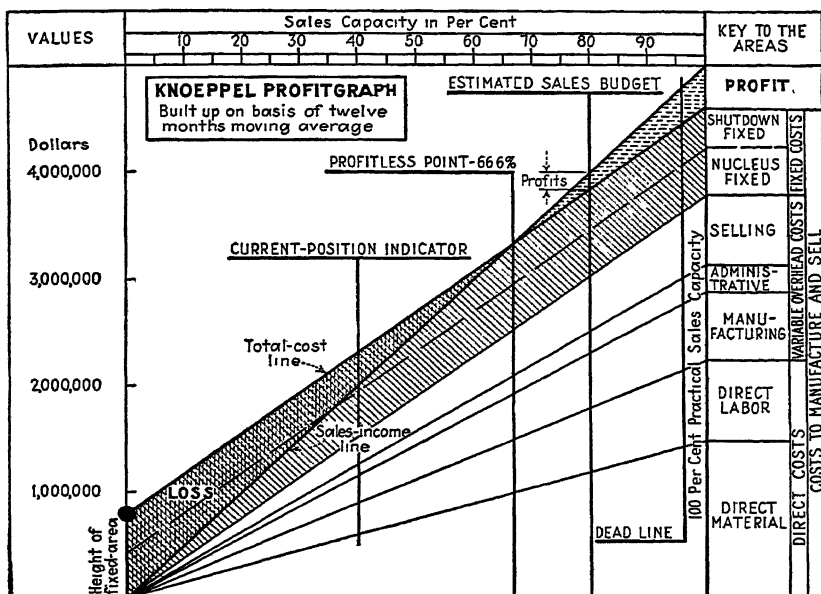


FIG. 18.

In this figure there is a series of nine simple charts, each one indicating a single step in transferring to the chart the factual data to be plotted. In each succeeding chart the plotting for the ones preceding it are shown by dotted lines, so that each shows all the previous steps taken.

In Fig. 18 we show the final result, all the elements being brought together in one place.

DIAGNOSING THE RESULT

A study of the Profitgraph just presented indicates at a glance that the business in question is not in a healthy condition. A study of it will show that:

PROFIT ENGINEERING

1. The profit area is too narrow.
2. The profitless point is too high on the capacity scale.
3. The business is losing heavily, as shown by the current indicator.
4. Deadline is entirely "out of bounds."

All of this indicates the vital need for remedial measures.

This conclusion is further emphasized by plotting the Profitgraph on the basis of percentages instead of dollars,

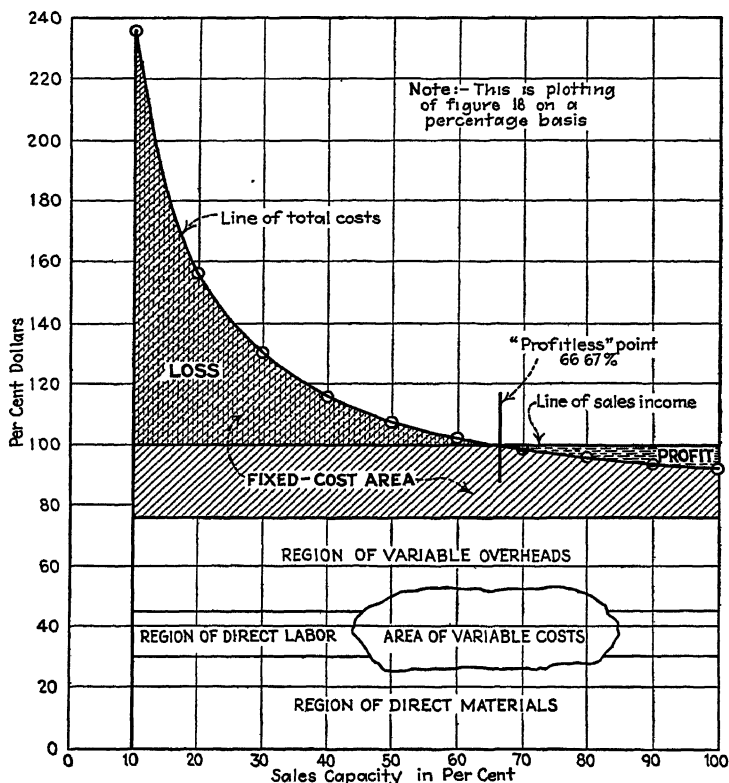


FIG. 19.

which is shown in Fig. 19. Here the influence of fixed costs on profits is strikingly illustrated, for, as will be seen, the fixed costs become *variable* as sales or units vary, while the variable costs are *fixed* because their relation to sales or units is constant.

It is clear, as one studies this graphic display of evidence, that something needs to be done about the matter of

BUDGETING FOR "REQUIRED" PROFITS

bettering this adverse showing—and at once. The question is, What to do about it, and how? After giving this question careful consideration, the management decides on this program:

1. Consider profits *first*.
2. Budget the business to operate within cost allowances after profits have been deducted from sales income.
3. Arrange for variable budgeting.
4. Provide sales and price betterment.
5. Reduce costs both fixed and variable, and in the order named.
6. Organize the business so that it can become "profit minded."
7. Secure cooperation of all personnel by providing profit targets and rewarding for "hits."

In other words, as Leonard Ayres said in the keynote quotation in this chapter, ". . . income should be coaxed up, and outgo pared down, at whatever cost of thought and efforts," which expresses the problem before the management of the business we are hypothetically considering.

THE PRELIMINARY PROFIT FORECAST

Because the management of this business in question is confronted with the task of "budgeting for profits," it is necessary to prepare a preliminary profit forecast, as the basis for later developing the Profitgraph which will become the "master budgeted variable-income statement," against which actual results can be related and variations from budgeted anticipations noted.

Without at this time going into the many and varied steps taken which result in the charting as shown in frontispiece (which steps will be considered later), we shall assume that all of the pivotal men of the organization get together on the common ground of determining what might be done—keeping in mind the Profitgraph covering the current twelve months—in the direction of:

1. Determining what profits should be earned.
2. Ascertaining the reasonable expectation covering probable sales.
3. Planning what reductions can be made in fixed and variable costs.

After these men have completed this important work—at "cost of thought and effort"—the profit forecast would be prepared.

PROFIT ENGINEERING

The purpose of this section of this chapter is to show what it would look like and indicate how it would be prepared, as shown in Fig. 20, with explanation of the progressive

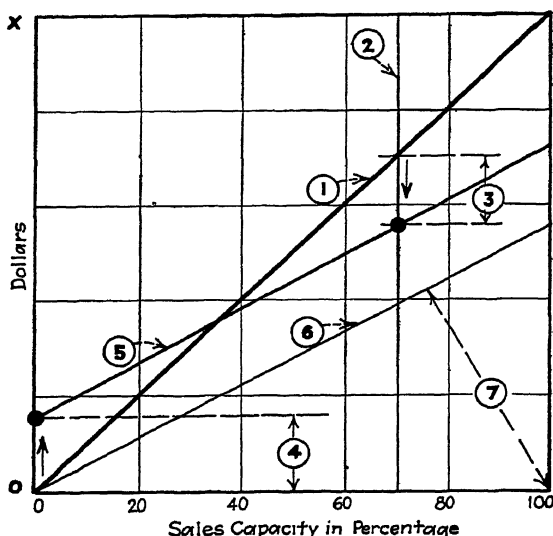


Fig. 20.—Preliminary profit forecast.

STEPS IN ORDER OF SEQUENCE

1. Sales-income line.
2. Reasonable expectation covering probable sales.
3. At proper point on budget line, from sales income down, place the required *profit point*.
4. Placing the "pivotal point" after arranging for a fair reduction in fixed costs.
5. Joining *profit point* on cost line with the pivotal point.
6. Draw the variable cost line parallel with the total cost line.
7. The "allowable" variable costs.

steps required. It is believed that this simple chart is self-explanatory, and that its study will be well rewarded.

FACTUAL BACKGROUND TO CONSIDER

Because the financial records of a business are the starting point and finishing line in the profit race, the first steps to the approach of "planned profits" is a review of balance sheets for a period of years, after they have been rearranged in accordance with the suggested setup shown in Chap. III on "Importance of Financial Records in Profit Making." This should be done in order to ascertain the net capital employed (assets) and net worth values which constitute the profit bases. Capital employed should be placed on basis of tangible values, by deducting depreciation

BUDGETING FOR "REQUIRED" PROFITS

and bad debt reserves, nonoperating real estate and plant, excess funds not needed in the business and invested in marketable securities, and good-will for which there has been no exchange of value. The net worth should be adjusted accordingly. In making this review for a period of years—five to ten—comparisons should be made, pertinent financial relationships determined, various analyses developed, and trends and tendencies noted.

Next comes the compilation of income statements for the same years as covered by the balance-sheet studies. These should be detailed studies, patterned after the sample shown in Fig. 16, in this chapter. Particular attention should be paid to the sales-dollar comparisons and the variations noted. The average for the period of years should be developed, and the relation of the best and poorest years related to it. Current year's showing should be given careful consideration. In making this analysis, use a work sheet with the years across the top and items down the side, to facilitate a cross study of each item. *These studies of financial records constitute the beginnings of a real betterment in profit making.*

REQUIRED PROFITS

The needs of the business, from the standpoint of excess of other outgo over other income (if any), interest on borrowings, dividends and current reserves, and additions to surplus account, may dictate one profit objective. More important is the mathematical approach to the determination of the profits required by the business, as constituting what the business *should* earn.

Regarding this latter approach, let us assume that the net capital employed in the case in question is \$7,500,000, with the tangible net worth being \$5,250,000, which means that the "net worth content" is 70 per cent (\$5,250,000 divided by \$7,500,000). Assuming further that we need 10 per cent on the net worth as surplus net profits (before dividends, reserves, and additions to surplus account), to maintain the cyclical average of 15 per cent on the net worth

PROFIT ENGINEERING

as the mean requirement for a period of years (three to five, preferably the latter), the formula would be:

$$70:100::x:10$$

$$70 \times 10 = 7.0 \text{ on the capital employed}$$

On capital employed of \$7,500,000, this would mean surplus net profits of \$525,000, divided, let us say:

Preferred dividends	\$ 75,000
Common dividends	200,000
Current reserves	50,000
<hr/>	
Total... ..	\$325,000
To surplus.	200,000
<hr/>	
Total... ..	\$525,000

Carrying our assumptions still further to include excess other outgo of \$50,000, and interest on borrowed capital of \$75,000, our "operating-profit" requirement on capital employed, *as the budgeting base*, would be:

$$\left\{ \frac{\$525,000}{87\% \text{ (income tax assumed to be 13\%)}} \right\} + \$50,000 + \$75,000 = \$728,448$$

which divided by the capital employed means an operating-profit requirement of 14.568 per cent as the goal of the management, to net a final 10 per cent as surplus profit for the owners.

This profit objective on the capital employed constitutes the economic profit objective. It is the profit requirement whether the sales are 50 or 150 per cent of capacity. Making the profit required is distinctly another story, but at least the work starts with a target for all to shoot at. If misses are made—and there will be misses at first—plans are such as to show where and by whom and why they were made, which is the starting point for betterments.

Expressing our profit requirement in terms of net sales income cannot be done at the moment as we have yet to determine the sales par. When we reach this point the hook-up will be made.

BUDGETING FOR "REQUIRED" PROFITS

REQUIRED SALES VOLUME

Another important phase of this work of "engineered profits," which now demands consideration, is the matter of the net sales volume needed for the ensuing year to net the required profit.

In one sense, this is not a question for the department responsible for profit planning to answer, as such a department is a staff department. Yet it is clearly within its province to determine, as in the case of the profit requirement, what the sales objective should be.

The matter of sales is important from another angle, as sales are the keystone in the work of profit planning, for, without sales, there could be no profits. Without an advance knowledge of what sales are likely to be for an ensuing period, no constructive steps can be taken with reference to planning factory production, employing a proper working force, purchasing material, arranging for borrowings or adding new lines and improving old ones. The sales budget becomes the hook on which all the other things hang. Unless sales are planned, other things cannot be planned.

Adequate planning for profits becomes, therefore, a matter of planning for sales as well.

There is another reason why sales are so important in the present economic scheme of things. According to Sidney A. Reeve, in "Modern Economic Tendencies," the relative change in production and distribution effort is as follows:

Year	Productive effort, per cent	Distribution effort, per cent
1850	80.2	19.8
1880	67.2	32.8
1900	59.9	40.1
1920	49.6	50.4

It may well be that, at this time, distribution effort is 60 per cent and productive effort is 40 per cent, and that by

1950 the division may be 80 and 20 per cent, thus reversing the 1850 figures.

There are four methods of approach in determining this matter of sales par:

1. The unscientific approach.
2. The mathematical approach.
3. The economic approach.
4. The scientific approach.

The Unscientific Approach.—This approach has no place at all in the work of profit engineering and would not be mentioned here, were it not for the fact that altogether too many firms in business are merely “guessers” when it comes to the matter of sales budgeting (?).

The author has met executives who have felt that because a plant can produce X dollars of products, sales should be X dollars. Others have had “opinions” that sales should increase at an arbitrary rate each year, without any factual support whatsoever for such contentions. Cases have been many where salesmen “estimated” the volume they could sell and, obviously, they “played safe” and set goals they felt sure they could attain.

Such ways of arriving at sales predeterminations are unintelligent to say the least.

The Mathematical Approach.—This approach is one that can be called the “statistical” method, in which an analysis of actual and average sales, by months and years, according to products and territories, would indicate the trends and rate of progress or growth, resulting in a projection covering sales for an ensuing period. This would plainly be a historical approach to the problem of determining what sales would be.

A business, however, has a definite relation to the condition of business in its own line, and to business in general. Inasmuch as the condition in a given industry or line, and of business in general, would influence the specific future course of a specific institution, it is well to consider the opinions of outside agencies covering forecasts as to probable conditions in the future.

BUDGETING FOR "REQUIRED" PROFITS

There is a wealth of material available as to this vital matter: services of forecasting agencies, bank letters and reports, trade papers, trade-association data, government reports, and the like. Out of some of this material would come a knowledge of variations from what can be termed "normal business." The variations of a given company should be compiled and then compared against the indices of others, with due allowance being given to the effect of seasonal swings. The result would be a forecast of sales to check against the historical projection previously mentioned.

In this connection, it might be helpful for a concern to compare its results for the secondary postwar crash of 1930, 1931, 1932, with the primary postwar crash of 1920, 1921, 1922, particularly with reference to what happened in the cycle 1923, 1924, 1925. History might repeat itself.

There is also another factor which may or may not be of value. This is the matter of turnover of capital employed (sales divided by the assets). If this turnover should be 0.75 to 1.0 in a business or industry, and the capital employed is \$1,000,000, then sales for a year should be \$750,000.

This mathematical approach can be most helpful in supplanting the unscientific approach just mentioned. It is being used more and more—and most successfully.

The Economic Approach.—Reference to this approach will be found in the section "The Economic Budget Point" on page 108.

The Scientific Approach.—This approach is the one which contains the greatest promise covering *needed* sales at *required* profits. It is an approach which views the entire realm of sales markets from quantitative as well as qualitative angles. It is an approach whereby controller and sales manager cooperate and, by coordinating their efforts, use the engineering or scientific method in arriving at a proper sales par.

The keystone in this approach is market analysis, both external as well as internal. It recognizes that the consumer viewpoint is a vital consideration. It, therefore, involves sales research as well as sales statistical work.

This approach brings controller and sales manager on the common ground of profits and sales, through synchronizing external studies of consumer demand and desire, and the mathematical and economic approaches just mentioned in this section, to the end that this scientific approach to the matter of determining sales par may mean maximum sales effort, at minimum cost.

How this all worked out in one notable case (Bausch & Lomb Optical Company) is set forth by E. S. LaRose, in his book "Practical Budgeting," published by National Association of Cost Accountants, as follows:

. . . in our own case, we removed the sales research and sales statistical divisions from the Sales Department to the controller's division. Upon completion of the tabulated facts in the Tabulating Department, they were then thoroughly interpreted by the Sales Research Department and finally handed to the Sales Department on a platter and on a well-interpreted basis. This change gave our Sales Department their full time for selling and has worked very successfully. Incidentally, the centralization and moving of the Sales Research and Statistical Departments reduced the expenses of these departments by approximately 60 per cent.

With reference to the matter of cooperation between controller and sales manager, Mr. LaRose has this to say (*ibid.*):

When our sales manager received his first budget for the month of January, 1927, and when at the end of the month a red figure showed that he was under, he came to my office and argued that we should put the budget on a quarterly averaging basis, because he was going to make it up in February or March. He hated to see red figures and at that time I thought I was going through the window. That same sales manager also argued that he did not see the necessity of having a daily sales record as our monthly record was good enough, even though it was obtained on the twentieth, or thereafter, during the following month. Inside of four months he was coming into the office every day, both morning and afternoon, putting his arm around my shoulders, and asking, "How are we coming today?" It seemed as though he just could not get into the harness quickly enough after he realized what it all meant.

Predetermining required sales volume is far from being the difficult task that it seems when controller and sales manager work together for *sales at a profit*.

BUDGETING FOR "REQUIRED" PROFITS

THE SALES GOALS

Out of these ways of going at the task of determining sales expectations—not counting the unscientific approach—will come a series of conclusions covering

1. What a fair standard of sales volume is, at 100 per cent practical capacity, as possibly the mean between theoretical sales capacity based on full use of plant facilities, and the cyclical average or normal volume. For purposes of our use in connection with the hypothetical case we have been considering, we have set this figure at \$6,000,000 per year.

2. What the theoretical 100 per cent sales capacity is based on a full use of plant facilities. The figure chosen for case material is \$8,000,000 yearly.

3. What the cyclical normal or average capacity is, taken as \$4,000,000 per year.

4. What sales can reasonably be expected for the ensuing year, as the budget goal—taken as \$4,500,000.

The relationships would, therefore, be:

	Percentage
Practical sales capacity.....	100
Theoretical sales capacity.....	133
Cyclical normal.....	67
Budget for ensuing year.	75

CAPITAL TURNOVER

It was mentioned previously that expressing our profit requirement in terms of sales income could not be done until sales par was determined. This hook-up can now be made.

It will be remembered that we required 7 per cent on assets to net 10 per cent on the net worth in order to maintain the cyclical average of 15 per cent as the mean requirement on the net worth. What we now want to know is: what does this 7 per cent mean in terms of sales income?

Inasmuch as the assets in the case being reviewed amount to \$7,500,000, and the sales budget is \$4,500,000, the capital turnover is:

$$\frac{\$4,500,000}{\$7,500,000} = 0.6 \text{ to } 1.0$$

PROFIT ENGINEERING

which means that sales are necessary for twenty months to turn this capital once.

Consequently, to earn 7.0 per cent on assets, with a turnover of 0.6 to 1.0, it means that our surplus profit must be

$$\frac{7.0\% \text{ wanted on assets}}{0.6 \text{ turnover}} = 11.67\% \text{ on sales}$$

or \$525,000 on sales of \$4,500,000. To determine what the real task is, in terms of operating profits in the sales dollar, we must add the amount to cover income taxes, interest, and excess outgo, or \$203,448 which is 4.52 cents of the sales dollar, making the total operating profit \$728,448, or 16.19 cents of the sales dollar.

Thus, we arrive at profit goal, sales par, and the objective before us in terms of the sales dollar.

CHAPTER X

PREDETERMINING AND BUDGETING “ALLOWABLE” COSTS

Formerly this company, like many others, budgeted sales or income and deducted therefrom the cost of production and distribution, the result being profit or loss.

Today this company budgets sales or income, then deducts reasonable profit—leaving allowable costs to be adjusted.

While the full application of the latter formula may not be possible—or while it may not be possible to curtail expenses to the amount that is necessary to leave a reasonable profit—its application will compel management to obtain a clearer picture of the business operations and expose those weak spots that have been costly and unnecessary and thereby enable management to effect savings which often result in profits instead of losses.—S. L. WILSON, president, American Writing Paper Company, in *Nation's Business*, January, 1930.

There are two important elements in this work of profit engineering:

1. The seemingly radical approach to the problem of assuring profits by making them the first deduction from sales income.
2. The importance to industry of the words “allowable costs.”

In other words, given a certain volume of sales and deducting a fair profit therefrom, what is left represents all that a business can afford to expend for what are called “costs.” The significance of this meaning is that costs are what they should be instead of what they are.

In planning cost outgo, therefore, what is necessary is to develop ways and means for so reducing costs as to eliminate, in so far as this is possible, the difference between what costs are and what they should be. This may seem easier said than done, yet there is a definite engineering

PROFIT ENGINEERING

approach to this problem that can be dignified by the use of the term "technique." This technique is coming into the industrial picture more and more—at greater profits to those using it.

THE COST TARGET

It is this matter of allowable costs that this chapter is concerned with, for with profit and sales requirements tentatively determined (as in previous chapter) the work now to be done is that of getting the over-all picture of the task ahead, by setting down these figures:

Net sales income at budget.....	\$4,500,000	100.00¢
Surplus profits budgeted	525,000	11.67
<hr/>		
Balance for costs, plus profits which have to be disbursed to other than owners of business .. .	\$3,975,000	88.33¢
Provision for excess outgo, interest, and income taxes....	203,448	4.52
<hr/>		
<i>Allowance for costs</i>	\$3,771,552	73.81¢

Viewing it another way, the budgeted operating profit is:

Profits to be disbursed to other than owners....	\$203,448	4.52¢
Owner's profit.....	525,000	11.67
<hr/>		
<i>Operating profit</i>	\$728,448	16.19¢

This calculation determines all that this hypothetical situation can afford to expend for cost of sales, which automatically standardizes outgo allowances, at least in total, if the required profits are to be made on sales that can reasonably be expected. After all, there are no more or no less than 100 cents in the sales dollar, and in this work of profit engineering, the *first* deduction is this 11.67 cents for surplus net profits.

ALLOWABLE FIXED AND VARIABLE COSTS

The problem with reference to the cost situation is to predetermine the relative fixed and variable components of cost, with particular reference to the location of the profitless point.

PREDETERMINING AND BUDGETING

It will be recalled that in Profitgraph (Fig. 18) the profitless point was at 66.67 per cent, and that the fixed costs were \$800,000 per year.

With the budget point at 75 per cent in the new set-up, the management of this hypothetical situation decides on a desirable crossover point of 35 per cent, desirable because it wants this point within the economic crossover range.

Through the use of this formula:

$$\frac{\text{Profit at budget} \times \text{"profitless point" desired}}{\text{Per cent of sales capacity at budget} - \text{"profitless point" desired}} = \text{fixed costs}$$

we can determine the allowable fixed costs as follows:

$$\frac{\$728,448 \times 35\%}{75\% - 35\%} = \$637,392$$

This means that the \$800,000 as previous fixed costs (see Fig. 16) must be reduced by \$162,608, if the point of crossover is to be at 35 per cent.

Adding the budgeted profit (\$728,448) and this allowable fixed cost (\$637,392), and dividing by \$4,500,000 as the budgeted sales, we find that the "fixed cost plus profit component" of the sales dollar amounts to 30.35 cents, which subtracted from 100.00 cents leaves 69.65 cents as the "allowable variable costs."

It should be said at this point by way of explanation—in order to avoid the charge that these determinations are merely a matter of using a slide rule—that following the preparation of the Profitgraph covering the current twelve months' results, and the development of the preliminary profit forecast, as explained in the previous chapter, work was undertaken by the management of this case under review, in the direction of surveying the possibilities in cost reduction by tentatively budgeting the detailed items of the sales dollar.

This analysis of detailed items was made after a review of past results, a proper consideration of present and probable future business conditions, surveys and investigations covering sales and operations, and conferences among the pivotal executives, from all of which predeterminations

PROFIT ENGINEERING

VARIABLE BUDGET INCOME STATEMENT FOR ENSUING YEAR

Item	Sales capacity, per cent										Readings from Fig. 16			
	20 per cent		40 per cent		60 per cent		Budget 75 per cent		80 per cent		100 per cent		100 per cent	
	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar
<i>Net sales income</i>	\$1,200,000	100.00	\$2,400,000	100.00	\$3,600,000	100.00	\$4,500,000	100.00	\$4,800,000	100.00	\$6,000,000	100.00	\$5,000,000	100.00
Direct material	348,000	29.00	\$1,044,000	29.00	\$1,566,000	29.00	\$1,305,000	29.00	\$1,392,000	29.00	\$1,740,000	29.00	\$1,500,000	30.00
Direct labor	168,000	14.00	504,000	14.00	756,000	14.00	680,000	14.00	672,000	14.00	840,000	14.00	760,000	15.00
<i>Direct Cost</i>	\$ 516,000	43.00	\$1,032,000	43.00	\$1,548,000	43.00	\$1,085,000	43.00	\$2,064,000	43.00	\$2,580,000	43.00	\$2,260,000	45.00
Variable manufacturing expenses (list items)	\$ 126,000	10.50	\$ 252,000	10.50	\$ 378,000	10.50	\$ 472,500	10.50	\$ 504,000	10.50	\$ 630,000	10.50	\$ 650,000	13.00
Variable administrative expenses (list items)	49,800	4.15	109,600	4.15	164,400	4.15	138,750	4.15	199,200	4.15	249,000	4.15	260,000	5.00
Variable selling expenses (list items)	144,000	12.00	288,000	12.00	432,000	12.00	540,000	12.00	576,000	12.00	720,000	12.00	650,000	13.00
<i>Total variable expenses</i>	\$ 319,800	26.65	\$ 649,600	26.65	\$ 980,400	26.65	\$1,190,250	26.65	\$1,279,200	26.65	\$1,599,000	26.65	\$1,550,000	31.00
<i>Gross total variable costs</i>	\$ 835,800	69.65	\$1,681,600	69.65	\$2,528,400	69.65	\$3,134,250	69.65	\$3,343,200	69.65	\$4,179,000	69.65	\$3,800,000	76.00
Fixed manufacturing expenses (list items)	\$ 137,302	11.44	\$ 274,604	11.44	\$ 411,906	11.44	\$ 514,250	11.44	\$ 537,600	11.44	\$ 670,302	11.44	\$ 650,000	12.71
Fixed administrative expenses (list items)	300,000	25.00	600,000	25.00	900,000	25.00	750,000	25.00	900,000	25.00	1,050,000	25.00	900,000	18.00
Fixed selling expenses (list items)	200,000	16.67	400,000	16.67	600,000	16.67	500,000	16.67	600,000	16.67	700,000	16.67	600,000	12.00
<i>Total fixed expenses</i>	\$ 637,302	53.11	\$ 1,274,604	53.11	\$ 1,911,906	53.11	\$ 1,764,250	53.11	\$ 2,037,600	53.11	\$ 2,420,302	53.11	\$ 2,150,000	42.71
<i>Operating profit</i>	\$73,708	6.11	\$1,425,396	6.11	\$1,688,094	6.11	\$1,365,750	6.11	\$1,456,800	6.11	\$1,821,000	6.11	\$1,200,000	24.00
Fixed costs and profit	\$ 364,200	30.35	\$ 728,400	30.35	\$1,092,600	30.35	\$1,365,750	30.35	\$1,456,800	30.35	\$1,821,000	30.35	\$1,200,000	24.00

Fig. 21.

PREDETERMINING AND BUDGETING

VARIABLE BUDGET INCOME STATEMENT FOR ENSUING YEAR.—(Continued)

Item	Sales capacity, per cent										Readings from Fig. 16					
	20 per cent		40 per cent		60 per cent		Budget 75 per cent		80 per cent		100 per cent		100 per cent		Variations	
	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	Amount	Cents of sales dollar	In-crease	De-crease
Total net sales.....	\$1,200,000	100.00	\$2,400,000	100.00	\$3,600,000	100.00	\$4,500,000	100.00	\$4,800,000	100.00	\$6,000,000	100.00	\$5,000,000	100.00		
Division of profits:																
Operating profit.....	\$ 878,028	22.70	\$ 91,098	3.80	\$ 445,298	12.64	\$ 728,448	16.19	\$ 819,498	17.07	\$1,183,698	19.73	\$ 400,000	8.00	11.73	0.09
Excess other outgo.....	13,333	1.11	26,667	1.11	40,000	1.11	50,000	1.11	53,333	1.11	66,667	1.11	60,000	1.20		
Net business profit.....	\$ 890,455	23.87	\$ 64,431	2.69	\$ 415,298	11.53	\$ 678,448	15.08	\$ 766,165	15.96	\$1,117,031	18.62	\$ 340,000	6.80	11.82	
Interest on borrowed capital.....	75,000	6.25	75,000	3.12	75,000	2.08	75,000	1.66	75,000	1.56	75,000	1.25	80,000	1.60	0.35	
Taxable profit.....	\$ 861,455	30.12	\$ 10,569	.45	\$ 340,298	9.45	\$ 603,448	13.42	\$ 691,165	14.40	\$1,042,031	17.37	\$ 260,000	5.20	12.17	
Income tax.....					44,239	1.23	78,448	1.75	89,851	1.87	135,464	2.25	31,200	0.62	1.63	
Surplus profit.....	\$ 861,455	30.12	\$ 10,569	0.45	\$ 296,059	8.22	\$ 525,000	11.67	\$ 601,314	12.53	\$ 906,567	15.12	\$ 228,800	4.58	10.54	
Dividends and reserves:																
Preferred.....					\$ 75,000	2.08	\$ 75,000	1.66	\$ 75,000	1.56	\$ 75,000	1.25	\$ 50,000	1.00	0.25	
Common.....					200,000	5.56	200,000	4.45	200,000	4.17	200,000	3.33	50,000	1.00	2.33	
Reserves.....					50,000	1.39	50,000	1.11	50,000	1.04	50,000	0.83	....	..	0.83	
Total.....					\$ 325,000	9.03	\$ 325,000	7.22	\$ 325,000	6.77	\$ 325,000	5.41	\$ 100,000	2.00	3.41	
RETAINED PROFIT.....	\$ 861,455	30.12	\$ 10,569	0.45	\$ 28,941	0.81	\$ 200,000	4.45	\$ 276,314	5.76	\$ 581,567	9.71	\$ 128,800	2.58	7.13	

FIG. 21.—(Continued.)

PROFIT ENGINEERING

were made as to outgo items. These were finally grouped under the major outgo headings.

The comparative income statement for the five- or ten-year period, mentioned in the previous chapter (section on "Factual Background to Consider") was then taken and, in a column headed "Tentative Budget for Ensuing Year," the predetermined amounts were set down.

As a result of this work, a variable budgeted income statement was developed for the ensuing year, at varying points of capacity (20, 40, 60, 80, and 100 per cent), as in Fig. 21. Opposite the 100 per cent figures, the comparable figures from the 100 per cent column on the variable actual income statement covering the twelve months' current picture (see Fig. 16) were listed and the variations noted, as will be seen by referring to the exhibit mentioned (Fig. 21).

COSTS TAKEN FROM 100 PER CENT READINGS

Items	From twelve months' picture, cents	Revised figures, cents	Reductions, cents
Manufacturing expense:			
Fixed.....	5.00	2.29	2.71
Variable.....	13.00	10.50	2.50
Total.....	18.00	12.79	5.21
Administrative expense:			
Fixed.....	4.00	5.00	+ 1.00
Variable.....	5.00	4.15	0.85
Total.....	9.00	9.15	+ 0.15
Selling expense:			
Fixed.....	7.00	3.33	3.67
Variable.....	13.00	12.00	1.00
Total.....	20.00	15.33	4.67
Recapitulation:			
Fixed.....	16.00	10.62	5.38
Variable.....	31.00	26.65	4.35
Total.....	47.00	37.27	9.73

PREDETERMINING AND BUDGETING

The fixed and variable cost comparisons are as shown on page 136.

THE MACHINERY OF COST PREDETERMINATION

Much more work was involved in bridging the gap from Profitgraph (Fig. 18) to that shown in frontispiece than the author has been able fully to describe heretofore. His problem was to get to the final Profitgraph by the shortest route consistent with a clear presentation of premises and pertinent factors. Of necessity, much was left to the imagination. It will be found, however, as the text unfolds, that the various parts have been considered with reference to a logical final arrangement.

One of the factors purposely left until now is that of briefly describing how the detailed elements in the outgo budgets were built up. This factor has to do with the statement in the introductory paragraph in this chapter: “. . . costs are what they should be instead of what they are.” We shall explain what we mean by the words “should be” in this way:

A quarter of a century ago a great industrial engineer, Harrington Emerson, gave the business world a new and, at the time, radical conception of costs. He said:

There are two radically different methods of ascertaining costs: the first method, to ascertain them after the work is completed; the second method, to ascertain them before the work is undertaken. . . .

The objections to the old method are not only that it delays information until little value is left in it, but that it is wholly and absolutely incorrect, mixing up with costs incidents that do not have the remotest direct connection with them, so that the analysis of costs statements . . . does not lead to elimination of wastes. The advantages of the second method are that costs as finally tabulated are the real costs divided as to each unit. . . . An analysis of costs so stated facilitates an almost inexorable elimination of inefficient conditions of all kinds, standard expenses being constantly standardized at new levels—wastes, the excess above standard costs, being constantly removed.

Ten years later, the author (a disciple of Mr. Emerson) in the Federal Trade Commission testimony, previously

PROFIT ENGINEERING

referred to, presented this principle with reference to the same subject:

PRINCIPLE 5. STANDARDIZED OPERATION COST

To place the burden of inefficiency and waste on the shoulders of those who produce it or are responsible for that condition, so as not to include it in prices paid by the consumer, costs of operation should be predetermined, on the basis of practical standards, within the attainment of workman, machine, department, or plant. Any difference between the actual costs, and the standardized costs, should be carried monthly into a departmental "Cost-adjustment Account," and closed into "Profit and Loss," at the end of the year.

Today, this doctrine of "standard costs" is almost universally accepted by industrial executives, in theory if not in actual practice. The outstanding exponent of this doctrine is that well-known accountant G. Charter Harrison.

In other words, what one's pulse beat is today as compared with what it was yesterday, and a month and year ago today, are meaningless comparisons. What it is today as compared with what it should be today is the vital consideration. So with comparisons in business. Standards should be determined and actual results related to them, all the way through from production costs to the component elements on income statements and balance sheets.

In developing these standards as to costs, the elements should be charted, with particular reference to the classification of costs previously described:

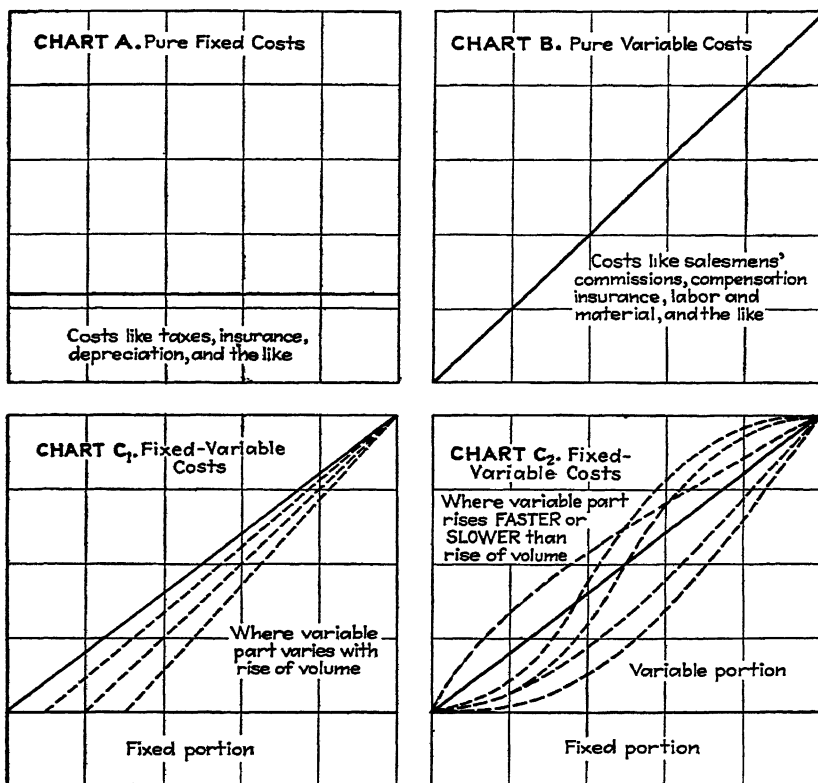
Pure fixed or F costs
Pure variable or V costs
Fixed-variable or $F-V$ costs.

In Fig. 22 the effort has been made to indicate how this charting would be done. The charts are self-explanatory and cover the variety of conditions that would be met with in any given case.

From the values shown on these charts any combination of costs can be built up, depending upon the position of

PREDETERMINING AND BUDGETING

the business at a given time, which would mean a corresponding variable budget for any variable actual result. *In developing these detailed budgets, 100 per cent practical capacity should be adopted as standard in all cases.*



Fixed-variable costs are such costs as advertising, office expense, executive's salaries, clerical, foremanship, supplies and the like.

Fig. 22.—Charts covering various budgeted items.

Results of whatever kind would be related to this common denominator.

In Fig. 23 we show a chart covering a specific item worked out in detail, one premise being that the variable line is a straight line, the other that it is a curve. To avoid complicated calculations, if the variability is a curve, the chord of each arc at 20 per cent progressions would be drawn to facilitate reading and determination of values.

PROFIT ENGINEERING

By way of explanation, the readings from 60 to 80 per cent on the curve, through use of multiples of 0.085 shown, are as follows:

Percentage	Dollars
60	1.50
62	1.58½
64	1.67
66	1.75½
68	1.84
70	1.92½
72	2.01
74	2.09½
76	2.18
78	2.26½
80	2.35

Reading at 64 per cent,

Variable.....	\$1.67
Fixed.....	1.20
Total	<u>\$2.87</u>

Covering the straight line, the procedure is more simple.
At 100 per cent the factors are

Variable cost.....	\$2.80
Fixed cost.....	1.20
Total.....	<u>\$4.00</u>

The reading at 64 per cent would be calculated:

\$2.80 × 64% =	\$1.79 variable cost
Fixed cost.....	<u>1.20</u>
Budget.....	\$2.99

Or this formula could be used:

$$\begin{aligned}
 100\% - 64\% &= 36 \\
 36 &\times 70 = 25.2 \\
 \$4.00 &\times 25.2 = \$1.01 \\
 \$4.00 - \$1.01 &= \$2.99 \text{ as budget}
 \end{aligned}$$

It may be argued at this point that, in building up values in the manner indicated, the total-cost line finally developed for the Profitgraph cannot possibly be a straight line.

PREDETERMINING AND BUDGETING

From the standpoint of a basis purely mathematical, this is a charge which cannot be and is not denied. Budgeting on the variable principle will be materially simplified if the curves are made as straight as possible, provided the results are not distorted appreciably, or in the form of a series of chords of arcs as indicated in the treatment here of

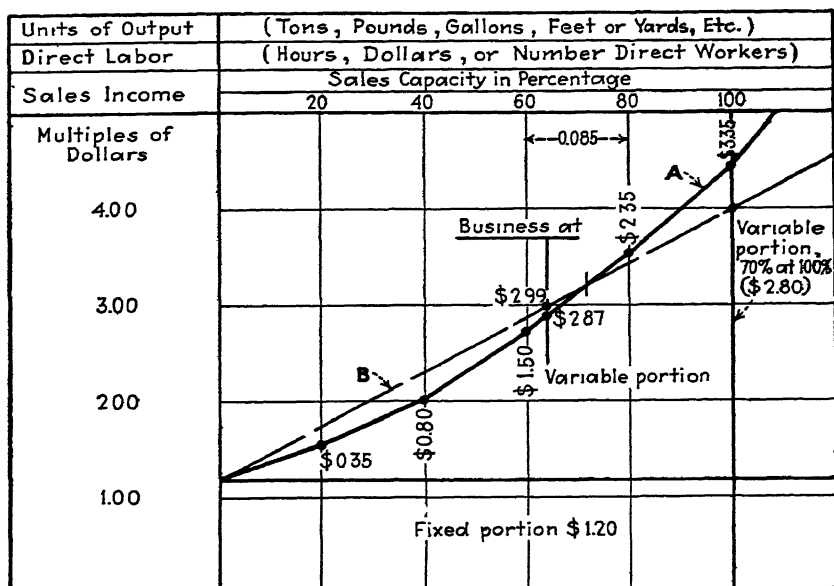


FIG. 23.—A typical budget chart.

one of the unit charts (Fig. 23). We later come to the matter of a curved cost line on the Profitgraph.

A STUDY OF UNIT COSTS

At this point we wish to state another principle: "Inasmuch as, in variable budgeting, all variable costs are relatively constant at any point up or down the capacity scale, over- and underabsorbed costing, covering manufacturing, administrative, and selling expenses, *applies to fixed overheads only.*"

The meaning of this principle will be plain by referring to Fig. 24, behind which are the figures shown on page 142.

PROFIT ENGINEERING

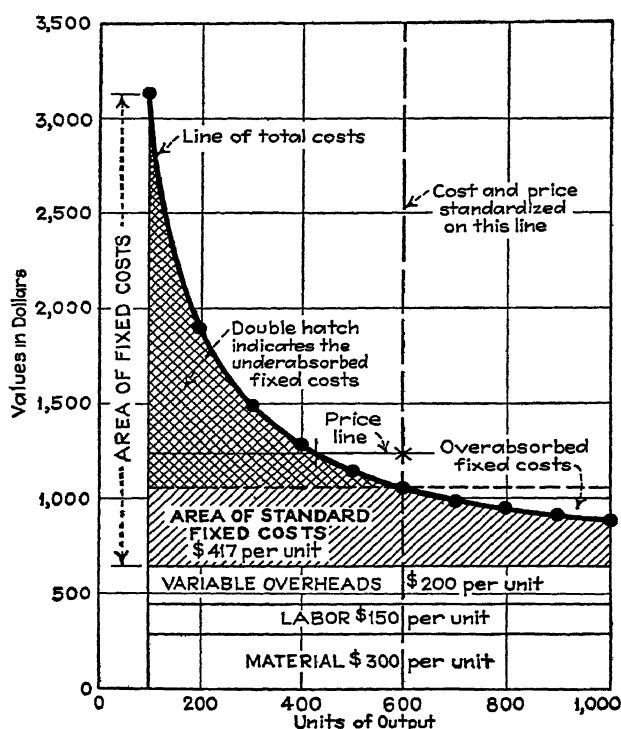


FIG. 24.—Chart of unit costs.

Units of output	200	400	600	800	1,000
Material per unit.....	\$ 300	\$ 300	\$ 300	\$300	\$300
Labor per unit.....	150	150	150	150	150
Variable overhead per unit....	200	200	200	200	200
Variable costs per unit.....	\$ 650	\$ 650	\$ 650	\$650	\$650
Actual fixed costs per unit at total fixed of \$250,000	1,250	625	417	312	250
Total actual costs per unit....	\$1,900	\$1,275	\$1,067	\$962	\$900

By standardizing fixed costs on some normal basis, as was previously advocated, the over- and underabsorption in fixed costs are as shown in the table on page 143.

PREDETERMINING AND BUDGETING

Variable costs per unit... ..	\$ 650	\$ 650	\$ 650	\$ 650	\$ 650
Standard fixed cost per unit...	417	417	417	417	417
Total per unit.....	\$1,067	\$1,067	\$1,067	\$1,067	\$1,067
Total actual costs per unit as above.....	1,900	1,275	1,067	962	900
Underabsorbed.....	\$ 833	\$ 208			
Overabsorbed.....	.....	.....	.....	\$ 105	\$ 167

A price line, at \$1,250 per unit, has been indicated on the chart, in order to show the relation of costs to price, both before and after the work of standardizing the fixed costs on the basis of normal capacity.

THE VARIABLE BUDGET

With variable budgeting it is possible, as soon as the production outputs and sales volumes are known for any month or accounting period (if the thirteen-period calendar is used), to assemble the standards for given outputs and volumes. If, for instance, the actual results for a month or period were at 60 per cent capacity, the variable standards corresponding to the actual results would be selected from the various costs cards or charts, and the totals arrived at by classes of cost, to which would be added the fixed costs. The various totals, in turn, would be added, thus making a total variable budget against which the actual cost results would be compared. The result would be a true comparison—actual results for a given volume, with comparable standards for the same volume. *Any other basis of comparison is fallacious.* Such a procedure would be developed for the current month or period, and for the year-to-date.

In addition, there would be developed another, and very important, set of figures, covering the year-to-date results projected ahead in terms of the fiscal year, in order that the showing at the end of the year—at the rate the business is progressing—can be appraised. Business is a yearly affair; the Profitgraph is a chart of yearly budgets at any point of capacity; and we have come to think and talk in

PROFIT ENGINEERING

terms of yearly results as to sales and profits. It is this compilation that serves as a basis for placing the "current variable-budget indicator" on the Profitgraph, as will be noted on frontispiece (at 82 per cent).

Obviously, such a projection should take into consideration any seasonal fluctuations in a given business. In some cases it would be preferable to make these yearly projections in terms of a twelve months' moving average, at least for the early months of a fiscal year while sufficient data are being accumulated to warrant a change to the fiscal-year projection.

The variable-budget record would be patterned somewhat after this form:

[illegible]

If the management of a given business still worships at the shrine of fixed budgeting, a three-column arrangement could be placed under each of the three headings, as follows:

Variable budget		Actual results		Fixed budget	

PREDETERMINING AND BUDGETING

When summarized, these various compilations would become part of the income statements.

THE GRAPHIC BUDGETED VARIABLE INCOME STATEMENT

As a result of the work which has been done by the management of the situation we have been considering hypothetically, in budgeting for profits and sales and determining allowable costs, it is now possible to plot the various elements and prepare the final Profitgraph, as reproduced in the frontispiece.

It is believed that the descriptive material so far presented in this and the three previous chapters makes unnecessary any extended explanatory remarks at this point with reference to this chart. It can be stated with conviction, however, that a careful study of this Profitgraph will be well rewarded. It forms the mechanism of *profit control* and constitutes management's "business instrument board," just as necessary to the progressive executive as the dial board which the airplane pilot can ignore only to his sorrow.

"PROFITGRAPHING" THE ACTUAL RESULTS

A Profitgraph covering the actual results at any time, projected for the year, to compare with the budgeted Profitgraph as shown in frontispiece, can be an efficient tool in profit making, especially if placed back to back, as shown in Fig. 25.

It has been pointed out repeatedly in these pages that the *angle* of variable costs, and the *height* of the fixed-cost area, exert a decided influence on the *location* of the profitless point and the *width* of the profit area. Any variation, therefore, in actual costs means a mathematical change in relation of total-cost line to sales-income line. While these periodic changes could be indicated on the budgeted Profitgraph, it would be next to impossible to show the complete story without destroying the efficacy of both actual and budgeted showings owing to confusion in lines and angles.

PROFIT ENGINEERING

Thomas D. Perry, a former coworker of the author, presented the idea of charting the actual results in relation to the budgeted results, by placing the two charts *back to back*, in an article "Profit Accounting," in *Factory and Industrial Management*.

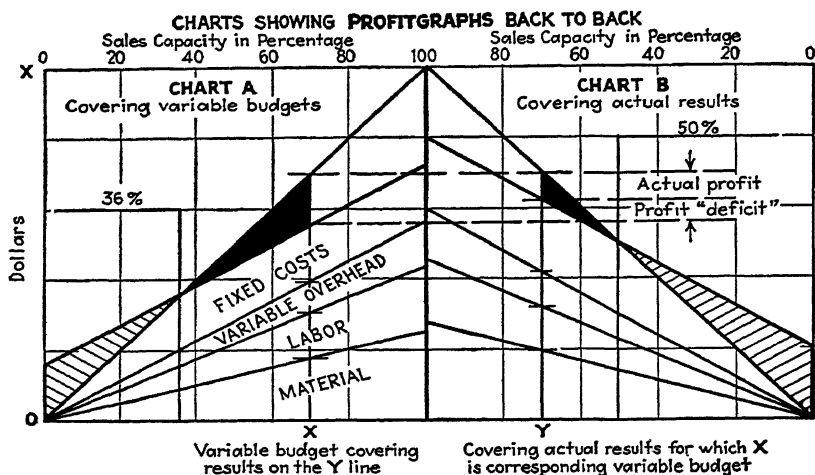


FIG. 25.

In Fig. 25 the application is carried further than the one shown in Mr. Perry's illustration, in that the actual results are related to the corresponding variable budget, with cross readings to indicate the "profit deficit," which is the amount by which the additional actual total costs cut into the expected profit at variable budget for the same position of the actual showing. In addition, the black triangles graphically portray the effect of the actual results varying from the budgeted anticipations.

In using this method it is not necessary to make large actual-result charts to use in placing against the budgeted Profitgraph as shown in frontispiece. A small reproduction of the budgeted Profitgraph can be made from month to month, or quarterly if desired, along side of which the actual-results chart can be placed.

A study of these two charts periodically, with progress observed and the reasons stated, can be most helpful in controlling profit making.

CHAPTER XI

CONTROLLING "ALLOWABLE" COSTS

Taking 100 as a unit, I allowed, let us say, five for rent, five for help, five for miscellaneous expenses, and ten for supervisory services and profit—a total of twenty-five for all charges, leaving a balance of seventy-five for merchandise.

The unusual thing about this is that I included the item of profit as part of the overhead expense. That was new! Instead of making profit a variable factor, I set a minimum figure on which it seemed safe to plan. Then, my overhead expense and profit provided for, I was free to concentrate all my attention on how much I could get the customer for his dollar.

This method was my simple insurance against failure, and that is what I am urging for business today. Too much is left to chance, and too little to proper planning.—W. T. GRANT, chairman of the board, W. T. Grant Company, in *Nation's Business*, March, 1932.

The assistant controller of a well-known concern, a subsidiary of one of the largest and best managed corporations in the country, who is both an engineer and an accountant, was placed in charge of a work known as the "control of uncontrollables." His problem was to ascertain why so-called uncontrollable items could not be controlled, and, having found out, to investigate in an effort to determine ways and means to reduce them. His studies embraced variable costs, like lubrication, and fixed costs, like taxes. As a result of his efforts, certain standards were established, along with plans of incentive reward for accomplishments.

A work of this kind will do much to remove the prefix "un-" from the word "uncontrollable."

As an aid to work of this character, a series of charts will be found most helpful, as described in the next section.

PROFIT ENGINEERING

COST-REDUCTION POSSIBILITY CURVES

As an aid in determining where to concentrate attention in predetermining allowable costs, a series of charts can be developed which will prove most helpful. What is meant is this:

In modern accounting practice, it is the custom to divide expenses into manufacturing, administrative, selling, and

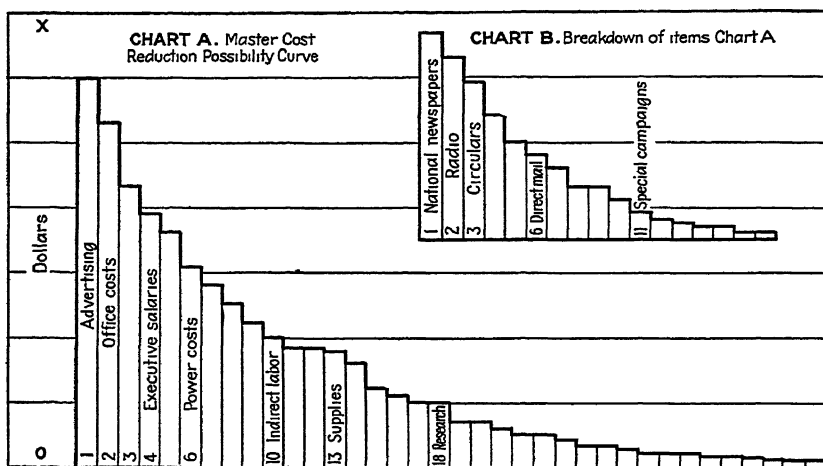


Fig. 26.—Cost reduction possibility curves.

shipping expense. In doing this however, *related* items are usually separated, so that we lose sight of the size and relationship of the details of these items. By bringing these items together and arranging them according to decreasing amounts, the result is a curve as shown in Chart A (Fig. 26). This gives us what is called a “cost-reduction possibility curve,” through the use of which we can consider “first things first.” Chart B is a breakdown of Chart A. Other charted breakdowns can also be made to indicate what the leading items are in each major account.

One large concern was amazed to find, after arranging related expenses on this basis, that out of thirty-two items of total overhead cost, six of the first ten were items which

CONTROLLING "ALLOWABLE" COSTS

seemed most susceptible to cost-reduction treatment, as follows:

1. Office costs.....	\$ 670,000
4. Power costs.....	470,000
5. Indirect labor.....	300,000
7. Maintenance.....	250,000
9. Supplies.....	220,000
10. Material handling.....	165,000
Total.....	<hr/> \$2,075,000

Needless to say, steps were at once taken to reduce these items, particularly 1 and 4.

RELATION OF SUPERVISORS AND WORKERS TO PROFITS

Supervisors are representatives of interests and directors of affairs. They "represent" the ownership and management of a business, in "directing" the use of machinery, materials, and men. They are the interpreters of the policies of management in the manipulation of the facilities of manufacture. While servants, they are also not only trustees—custodians—of material things, but leaders of human beings as well. If they only knew it, they are—by delegation—at the heads of small businesses, the sum of which go to make the entity we call a business.

Modern business has grown to be terrifically complex, and with this growing complexity there has been forced on business the absolute need for elaborate accounting practice. The author has never met a business executive who maintained an elaborate system of accounting just for the fun he got out of it. Stern necessity has demanded adequate, comprehensive, prompt, and accurate records, which in their many ramifications conform to the check- and pass-book transactions of individual and bank. Supervisors should be led to see this, for, if it is important for management to record the essential in all financial transactions, in order that it may render an account of its stewardship to the stockholders, it follows that supervisors, as heads of small businesses, need accounting, and for the same reason.

They need to render an account of their stewardship to management.

Let's assume that, instead of working as they do, supervisors in a given plant should actually be in business for themselves on some cooperative basis. They would invest no money but would be expected to pay bills rendered monthly for expenditures made for their account. They would sell what they made, to the company and to each other, and collect the money. The difference between receipts and expenditures would be profits, from which a share would go to them as a reward for efficiency and economy.

These supervisors would see to it that all transactions they had to do with were promptly and accurately accounted for, and you may rest assured that there would be a keen desire for prompt and reliable statements—and a careful study of them after they were received—because they would involve receipt and payment of “coin of the realm.”

The author does not believe there is any greater problem having to do with the operating side of a business than that of interesting supervisors in cost and accounting records. And, the greater this interest, the greater will be the profits. Take the matter of depreciation, for instance. Supervisors seem to pay little attention to it. They probably agree with the definition of it, made by the Missouri Supreme Court, as “invisible rot.” But let us see.

Laying aside all of the learned and technical explanations with reference to this seemingly difficult phase of accounting, we can put the matter before supervisors in this practical way. Assume that one of you should get tired of being a supervisor and should go into the taxicab business like “Amos 'n' Andy.” You would pay, we shall say, \$3,000 out of your savings for the cab. This \$3,000 is your capital. In the last analysis, capital is merely the savings of people.

Out of the fares you take in for operating this taxicab you would pay for gas, oil, tires, repairs, garage rent, and an occasional painting, and you would keep the balance

CONTROLLING "ALLOWABLE" COSTS

with which to maintain yourself and family. Now you *are* a business man, but are you a good one? Let's see.

Four years pass, and you find that you have a pile of junk on your hands, worthless to all but the scrap dealer—and he pays you little for what is left. You need a new cab. But you have no money to purchase it with. This is so because during the four years you spent all of your income over expenses and you have nothing in savings.

You suddenly wake up to the fact that you have exhausted your capital, so you decide to go back to work as a supervisor and save another \$3,000, with which to buy the second taxicab. This time you know what to do as a good business man. You pay your costs out of your fares as before, and, in addition, you set aside \$60 per month, let us say, and then live on what is left of your income. During the fourth year you take your old taxicab—which is junk as the first one was—plus the accumulation of money that you "reserved" out of your fares and get yourself a new cab.

In the latter case, you made your customers pay for the capital invested in the taxicab, as part of your costs, and in proportion to the useful life of the cab (assumed here to be four years), thus insuring the return of the capital to you with which to buy the replacement. In the first instance you gave the cost of the car to your customers and were out of luck when it came to buying a new cab, because you couldn't go back and tell them you had undercharged them in fares.

This is a homely and unorthodox way of explaining depreciation, but it is usually successful, even when the author encounters executives who tell him that there is no such thing as depreciation.

The point about this illustration is that you must keep your taxicab busy to pay your expenses, set up the reserve of \$60 per month, and live on what is equivalent to your gross profit as a business man, out of which must come your salary—the net being your real profit. If your cab was idle for any length of time it would mean that this idleness would be at the expense of but one thing—your profit.

So with buildings and equipment. The more you can use them, and the more efficient the processes of production are, the less will be the costs for the capital charges per unit of production. This will mean larger relative profits per unit. Idle plant and machines would build up the cost of overheads, thus reducing profits.

This matter of *idleness* is a serious matter, much more serious than most supervisors think. An idle workman is bad enough, but an idle machine is infinitely worse. A machine has men built into it who multiply themselves in the work they have to do. For instance, if a machine takes the place of five men, then you have a case that is equivalent to five men being idle when the machine is down. Supervisors are quick to see to it that idle men are put to work or dropped, but are they more concerned when machines are idle? The author has often felt that it would be a fine thing if each machine could have a placard on it reading, "This machine is equivalent to the work of — men. Its cost for idleness is — cents per hour, or \$— per day." Then idleness would be watched much more carefully. We grant you that supervisors cannot "pull the work out of the air" to put on idle equipment, especially in these times, but once get the facts about idleness before all—executives, salesmen, supervisors, and even workmen—and you may rest assured that, sooner or later, something is going to be done about it—for idleness costs money.

The item of *rent* is another item for supervisors to consider. If they were in business for themselves and had to pay for their departments—for power, light, heat, depreciation, and repairs—on a square-foot basis, they would see to it that they had the most efficient layout of equipment and work spaces possible, so as to have the least amount of footage and, therefore, the least cost for rental. A foreman once asked for extra room for his department. He was told he could have it for — cents a foot. A few days later he submitted plans for housing his department in *smaller* quarters, so as to have his production costs less.

CONTROLLING "ALLOWABLE" COSTS

Another factor for supervisors to watch is that of *maintenance*. "A stitch in time saves nine" is an old saying and is apropos in connection with maintaining plant and equipment. Anticipative inspection, making repairs out of work hours, studying to make machines stronger and faster, and the like, are means to keep the maintenance costs at a minimum per unit of output.

In this connection, real savings can be made by organizing a Maintenance Planning Department after the pattern of our modern production-planning functions. Supervisors can also help in what is known as "speeding the turnover." Keep stock of raw materials as low as is consistent with demands; eliminate the obsolete, scrap, and excess materials; keep work in process on a "hop-skip-and-a-jump" through the plant; do not stock up more than is necessary on finished parts and assemblies. In these days turnover of inventory, of plant, and of capital should receive more than passing attention, for the faster the turnover, the less profit per unit is required to net the required return on capital investment. Don't overlook turnovers.

Regarding *rejections*, there is still room for improvement in reducing their cost, through a proper analysis of causes. Many rejection slips give the reasons for the rejection without stating what the "causes" were. We well remember the case of a large foundry in which the estimate was that 50 per cent of the rejections were caused by bad iron and poor cores. Slips covering all rejections had the real reasons indicated thereon, after careful examinations were made, and these were then classified according to causes. To the amazement of all it was found that 50 per cent of the rejections were for causes within the control of the molders and core makers. In another case the rejections were cut in half by investigating the causes, classifying the results, and instituting betterment measures.

In like manner other items can be considered, such as indirect labor, supplies, shop clerical, tool room, the store-room, inspection, and the like.

PROFIT ENGINEERING

Other avenues can also be explored. Supervisors can consider the matter of time study, wage-incentive plans, standardization of machines and tools, plant layout, material control, production planning, and many other items, out of which can come better ways of doing things.

One of the greatest fields we know of for making savings which can be added to profits is that known as waste elimination. Waste is too often looked upon as the contents of ash can and garbage pail and the scrap heap; as the ends of rods, turnings, slag, and the like. To altogether too many, waste elimination is synonymous with "salvaging." Although not underestimating salvaging in the least, our idea of waste elimination goes much deeper and has to do with tapping the potential thinking power of all employees, whether in shops or offices. In one plant using \$7,000,000 worth of materials, nearly \$500,000 was saved in one year through an engineering approach to the problem of waste in material, *enough to give this company its dividend requirements.*

In another case, that of a large shipbuilding company, a waste-elimination campaign was inaugurated, and the resulting savings amounted to over \$264,000, 55 per cent of which came from supervisors and 45 per cent from the workers. Speaking of this work, one of the company executives in writing about it in "Manufacturing Industries" said:

Aside from the financial gains which have resulted and will continue to result from this first coöperative campaign by the entire force to reduce waste, there has come about a better understanding and relationship, a better acquaintance, between management and men—workers, supervisors, and executives—and the strengthening of the spirit and will to win all along the line. The stimulus given to "creative thinking" by such a campaign may be worth more in the long run than the suggestions themselves, valuable as these may be, for it gives every man the stimulus always felt by a more personal interest and a closer touch with his work.

A waste-elimination campaign can be both quantitative and qualitative. On the one hand, arrange to induce sugges-

CONTROLLING "ALLOWABLE" COSTS

tions regarding whatever the employee wants to bring to the management's attention, and as many times as he wants to. On the other hand, guide the suggesting by giving out hypothetical questions regarding problems within the department from which it is desired to secure suggestions.

By properly organizing this waste-elimination work so as to make it a permanent thing, the plant is virtually building into its machinery a staff department. Staff organization is the organization which augments the line organization. Its function is investigative, analytical, advisory, and formulative. Its real job is to prepare outlines of what standard practice should be, and, if accepted or modified by the management, they are then put into operation by the line organization. A good balance between line and staff is the ideal industrial organization.

MAKING FIXED COSTS FLEXIBLE

In periods of reduced volume, the serious problem before a management of a business is that of meeting the fixed-cost requirements, of both the "shutdown" variety and those which are part of the "fixed-variable" costs.

It is not a difficult task, if proper plans have been made, to control variable costs so as to make them flexible. The real difficulty comes when arranging for flexibility covering some part of these fixed costs.

To aid in this, plans can tentatively be made as indicated in Fig. 27, which then serve as the basis for subsequent control. In these plans, costs are divided into three classifications:

- A. Minimum fixed costs which *must* be paid.
- B. Additional fixed costs which *should* be paid, but which can be deferred.
- C. Other fixed costs which *can* be paid if income justifies it, otherwise not.

Schedules would be developed for Class B and C, indicating the order of importance in paying.

PROFIT ENGINEERING

As volume drops below the profitless point, steps can be taken to stop part or all of the *C* charges, then defer part or all of the *B* charges, depending upon how far down this volume falls, until the 44½ per cent line is reached, after which there can be no further relief, as the *A* costs are those which must be paid.

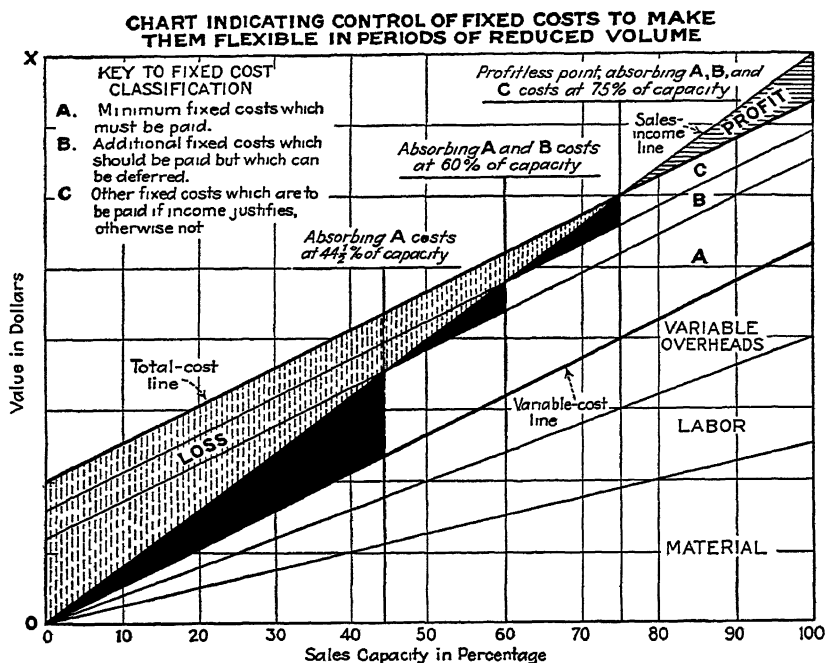


FIG. 27.

In recasting the regular Profitgraph to prepare plans as suggested, interest charges can fittingly be included in the *A* costs. As volume rises, the *B* and *C* costs can be absorbed as shown in the black triangles, and, thereafter, operations can be carried on in accordance with the regular Profitgraph plans.

TRANSFERRING FIXED COSTS TO VARIABLE-COST AREAS

While admitting the effect of fixed costs on profitless point and the width of cost area, the reader is likely to feel that it is more difficult to reduce fixed costs than

CONTROLLING "ALLOWABLE" COSTS

variable ones. While in many cases this is true, there may be a way out through the consideration and use of this principle:

To the degree that certain parts of fixed costs can be transferred to the variable classification will the profits start to show at a lower point on the sales-capacity scale and become relatively wider from the profitless point until the 100 per cent line is reached, when profit would be the same if the totals of such costs remain the same.

As an example of what is meant, let us consider the matter of management personnel. In periods of booms and depressions we find that there is a rise and fall in wages of labor, prices of material, certain items of expense, interest charges, dividends to stockholders, and other items. This is not the case, however, with the item of management salaries—at least not to the same degree. Management employees are usually the last to participate in increases in salaries in prosperous times and among the last to be reduced in depression times, with these reductions often only nominal in nature.

On the other hand, more and more workmen, foremen, salesmen, and clerks are being paid on some form of incentive plan, whereby rewards are proportional to accomplishment, either individual or collective. Should not the same rule apply to major and minor management executives, who are, in the last analysis, responsible for profits?

Business is a cyclical affair and in most cases seasonal as well. Why should not management salaries rise and fall with cyclical and seasonal swings? This would be logical if we look at the matter from the standpoint of the economics of profit making.

A PLAN OF MANAGEMENT INCENTIVES

In Fig. 28 is a suggested treatment covering this matter of management salaries, in the form of a principle governing incentives. As management is, in the last analysis, the agency responsible for profitable sales, it follows that a logical reward should be one paid in proportion as volume

PROFIT ENGINEERING

and profits rise or fall. If they fall, salaries to management personnel should be reduced. If they rise, this personnel should be liberally rewarded. The process should be automatic, so as to avoid what is called "cutting" at one time, and get away from the debates, inaction, and delay regarding "raises" at another time.

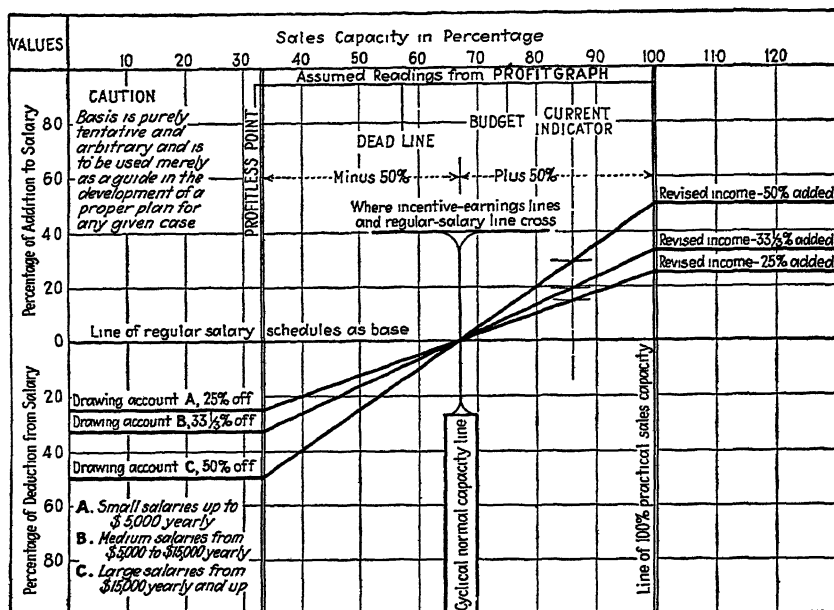


FIG. 28.—Chart of management incentives.

In the chart mentioned, such a plan is suggested. On the assumption that, in a given case, the cyclical normal capacity line is at 67 per cent, then at $33\frac{1}{3}$ per cent of capacity (or 50 per cent less than 67 per cent), we would pay drawing accounts which are 25, $33\frac{1}{3}$, and 50 per cent less than the regular salary schedules, covering what can be called small, medium, and large salaries, (see tentative division on chart). At 100 per cent full practical capacity (or 50 per cent added to 67 per cent), salaries would be paid by an amount approximately equivalent to regular salaries, plus the percentage of reductions at $33\frac{1}{3}$ per cent of capacity, thus restoring the decreases. Between $33\frac{1}{3}$ and 100 per cent,

CONTROLLING "ALLOWABLE" COSTS

salaries would rise in a straight line, thus making—in this illustration at least—the line of regular salary schedules and the incentive earnings line *cross* at the cyclical normal-capacity line, or 67 per cent in this case.

Assumed readings from Profitgraph show the relation of the pertinent factors in the budgeted variable-income statement, to the incentive factors in the suggested plan for management personnel.

Such a plan would not cover workers or clerks or foremen or salesmen, all of whom should be working on some form of individual or group plan. It would cover all superintendents, managers, executives, and officers—even directors of a corporation if active in the management of the affairs of the company.

Support of this principle comes from A. E. Waller, Bronxville, N. Y., who said in an article "Government Supervision or Self-Discipline," in *Factory and Industrial Management*,

In order to place management on the equivalent of a piece-work basis, the manner of its compensation should be such as to respond very sensitively to the profits and losses of the corporation. Management should be generously rewarded for profit-making policies and efficient conduct of business; it should be heavily penalized for inefficiency. The reward for efficiency should come after proper consideration has been given to the employee group and to the stockholder group, in the order named. The penalty should be imposed before the stockholder group and the employee group suffer any loss, in the order named.

In this article Waller laid down this principle: "That the people responsible for the management of the concern be retained at nominal salaries, which, when the business is operated profitably, would be supplemented by very generous bonuses."

The incentive plan tentatively suggested herein—with the note of caution mentioned on the chart to be taken into consideration—accomplishes what Waller calls for. In addition, it provides a definite rise and fall in salaries between abnormal and subnormal points, whether due to cyclical or seasonal swings.

Furthermore, it accomplishes that very necessary task confronting those responsible for profit making—that of

PROFIT ENGINEERING

lowering the profitless point on the capacity scale and *widening* the profit area until 67 per cent is reached—after which the profit area would be less by the amount of bonuses paid to management personnel.

COST LINE AT DIFFERENT ANGLES

In following the principle of transferring part of the fixed costs to the variable classification—particularly if manage-

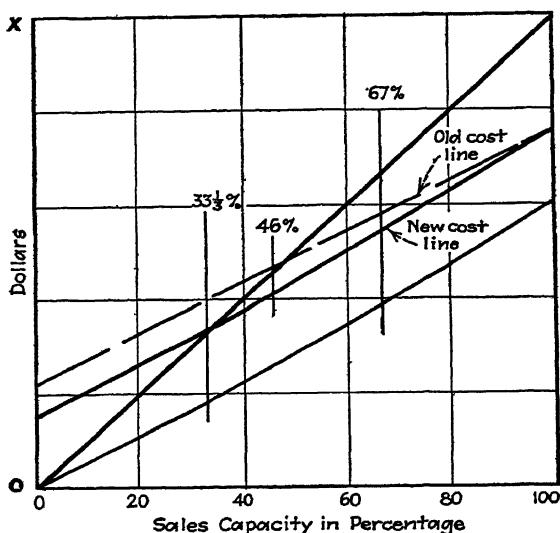


FIG. 29.—Chart illustrating curved cost line.

ment incentives are introduced in a business along the lines outlined herein—the suggestion is made that what would otherwise be a curved total-cost line be made in a series of straight lines, as chords of arcs, three or more in number, along the lines indicated in Fig. 29.

CHAPTER XII

CONTROLLING TO "ASSURE" PROFITS

To think profit control instead of cost control will alter the entire psychology of most of our organizations.—"Industrial Executive."

It was quite a task to sell them on the ideas at first but when they really grasped the meaning of control for "engineered profits" they went to work in earnest.—From letter by an executive in charge of work for a former client.

The modern merchant liner is as near to being the last word in efficiency as human inventiveness can make it. Such a ship is a large warehouse, a complete cold-storage plant, a luxurious floating hotel, and a gigantic power, heating, lighting, water, and refrigeration plant, all rolled into one, with every factor properly synchronized.

Managing one is a great business, based on the engineering sciences and navigation laws. Its objective is profit. And to make it, there is the need for absolute control at all times, confronting as it does the unknown forces and adverse influences of nature's elements.

The modern business ship should, likewise, be as efficient as human ingenuity can make it. It is a great activity for service to the race, involving men, money, machinery, materials, methods, and markets, all of which should be properly synchronized.

Managing a modern business is a great work, based on the engineering sciences and economic laws. The objective of business is profit. And to make it, there is the same need for absolute control at all times, confronting as it does the unknown forces and adverse influences of competition, finance, and politics.

The majority of modern ships are efficiently controlled; the majority of businesses are not. Shipwreck at sea is the

PROFIT ENGINEERING

exception; the majority of concerns which embark on the seas of business are inevitably doomed to a trip to the commercial "Davy Jones' locker." The inference to be drawn from these comparisons should be obvious.

SHIP CONTROLS

Let us examine, for a moment, the marvelous ship controls which center in the pilot house and chart room of a vessel, so that we may develop analogies that might aid in bettering our business controls. A course is determined upon, the "gyro pilot" is set to correspond, and no helmsman is thereafter needed to keep the ship on its mapped course, although hand steering can be resorted to if desired. With the pelorus, the ship can take the bearings of a distant object, with readings shown on a compass card. The radio direction finder will determine the bearings of a distant radio station whose signals have been intercepted, with readings shown on a compass card.

The audible fire signal detects the presence of fire in the passenger quarters, lockers, and storerooms protected by the automatic fire-alarm system. The fire detector indicates fires in holds and controls the steam-smothering lines to extinguish hold fires. The watertight door panel controls the closing and opening of all electrically operated watertight doors in the ship's transverse bulkheads.

The emergency alarm operates bells in crew's quarters, while the emergency lighting panel controls the emergency lighting generator in case there is a breakdown in the regular lighting circuit. There are, of course, several other indicators—covering speed of vessel, course and distance, propeller shaft revolutions, and rudder position. Apparatus for communication on and from the ship is highly developed. In addition to telephone and voice tubes, there is the Morse signal light for code communication, operated by keys from the pilot house, as well as searchlights with hand controls in the pilot house. There are also steam and electric whistle pulls. The navigation lights are controlled by "tell-tale panel" located in the pilot house. Then, there is the "mag-

CONTROLLING TO "ASSURE" PROFITS

navox telephone" (loud speaking) for communication with forecastle head, engine room, after docking bridge, and steering engine room. There is also the mechanical speed-order telegraph for transmitting instantly, and visibly recording, change of speed orders from pilot house to engine room; also the mechanical combined docking and steering telegraph for transmitting docking and steering orders between pilot house and docking station.

In addition to magnetic compasses for stand-by use, there is the master magnetic clock for operating repeater clocks throughout the ship.

The submarine-signal receiver determines the depth of the water; the clinometer measures the amount of ship's roll; the chronometer is used in making astronomical calculations; the sextant is used to determine latitude and longitude; the psychrometer is a combination wet and dry bulb thermometer for determining relative humidity; the barometer measures atmospheric pressure; the anemometer is used for measuring wind velocity.

Added to all of this there are maps, binoculars, course charts, slide rules, drawing instruments, chart paper, books on navigation, engineering handbooks, and other aids.

It is because of this seemingly elaborate but absolutely essential control machinery that shipwreck is the exception. With analogous controls, the majority of business ships can weather the gales and dodge the rocks of commerce, and business wrecks can be the exception.

The pertinent question at this point is, What are some of the more important mechanisms needed for adequate profit control?

VI. VARIATION ACCOUNTING

It is becoming apparent, the more business is studied, that a profit or loss figure is merely a composite figure—the average of a number of profits and losses—instead of something absolute and final in itself. A single profit or loss figure is meaningless from a management standpoint. In other words, a business is made up of a number of diverse func-

tions, some of which really make our profits, while others make our losses. If therefore the true profit objective is to have all functions contribute profits, then control machinery should be developed to indicate when they fail to do so, as well as to show how much the profits are when there are profits. In casting about for a way to do this, the results which have been achieved by the medical profession in its admirable work of isolating disease germs, come to mind. *Why not isolate industrial loss germs?*

There are many loss germs, but here is a list of eight which, in many cases, can be isolated and evaluated quantitatively:

1. Prices being less than concern should receive for goods.
2. Purchasing at the wrong time.
3. Manufacturing below a normal capacity.
4. Selling below a normal capacity.
5. Faulty use of materials in fabrication.
6. Inefficient labor in fabrication.
7. Quality below that specified.
8. Excess of other outgo over other income.

Let us devote a few minutes to considering these in their order.

1. *Price Losses.*—For any given article there is a right price, an economic price, a price in which profit has been calculated with all the other profits on other goods, to yield the required return on the investment as a whole. Selling goods for prices less than these standard prices means loss in income—an economic loss. In many cases the standard prices cannot be charged, but the difference between the standard and actual prices should be a matter of record. The best place to reflect the difference is in the financial books of the company. It would surprise many concerns to know what this difference amounts to monthly and yearly.

2. *Purchasing Losses.*—In one of the industries of the company—the manufacture of insulated wire and cable—large quantities of copper, rubber, lead, tin, and cotton are used. These are basic commodities subject to major market fluctuations. If there is high-priced material on hand in a

CONTROLLING TO "ASSURE" PROFITS

falling market, heavy losses are sustained. On the other hand, if low-priced material is on hand in a rising market, excessive profits are made. These swings are cyclic. They may or may not be a "within-the-year" proposition. They are without reference to manufacture, the efficiency of which may be constant during periods of loss or gain from purchasing. Unless these swings are isolated and treated separately, both cost and price calculations may be misleading and dangerous. Material should be carried to inventory at cost at time of receipt and to work in process at market or standard at time of use. This difference can be cleared to "purchasing profit and loss."

3. *Manufacturing Capacity Losses.*—Mention has been made before of the sales manager who once said to the author that, if he used cost estimates on which to base prices when the business was operating at 40 to 60 per cent of capacity, his prices would be so high that he would lose orders. On the other hand, he stated that, when the business was operating at 100 to 120 per cent of capacity, cost estimates were so low that adding only a normal profit meant prices lower than he knew he could get for his goods. In both cases, he threw the cost estimates into the waste basket and made prices which he was reasonably certain would secure the business. He further said that only when the business was operating at average capacity could he rely on the cost figures. This basis we finally called the "normal basis."

It all gets back to the matter of whether all manufacturing overhead is to be applied to one-half or twice the normal production, depending upon the swing. As in the case of materials, these volume or capacity swings are cyclic. They may or may not be a within-the-year proposition. They are without reference to manufacturing, the efficiency of which may be constant during the abnormal and subnormal periods. It is therefore necessary to standardize the manufacturing overhead at normal manufacturing capacity and take the underearned or overearned amounts to "manufacturing volume or capacity profit and loss."

4. *Selling Capacity Losses.*—Costs of administration and selling being looked upon as commercial costs and, therefore, related to sales, the same argument applies here as in the treatment of manufacturing overhead. The proportion of commercial costs to assess against the sales of a period varies in the ratio of the sales capacity actually employed to the normal sales capacity, the differences to be carried monthly to “sales volume or capacity profit and loss.”

5. *Faulty Use of Materials.*—More and more attention is being given to waste elimination in materials by determining allowances for it. Actual consumption is a matter of record. The difference represents waste due to inefficiency in the use of materials. This difference should be carried to “material waste.”

6. *Labor Inefficiency.*—What labor should cost for a given item is one thing. What it does cost is distinctly another. With our many modern incentive systems, it is not a difficult matter to determine the difference between them. This difference should be carried to “labor waste.”

7. *Quality Losses.*—In many plants, particularly in process plants, there are definite standards as to quality. When quality is below standard, there are excessive rejects and returns or allowances. Differences between actual results and standards as to quality should go to “product waste.”

8. *Financial Losses.*—In accounting practice, it is customary to add “other income” to operating profit and then subtract “other outgo” in order to arrive at the net profit figure. To furnish an accurate picture of the financial side of the business, the excess, the one over the other, of this financial income and outgo should be shown as a “financial profit or loss.”

Accounting can be effective and economic and aid in profit making only when the relative contributions to profit and loss are definitely calculated and kept separate. The praise and reward for profit making can then be given justly and fairly. Responsibility for losses can likewise be placed where it belongs, and betterments arranged for. Why?

CONTROLLING TO "ASSURE" PROFITS

Because profits or losses are simply a matter of "where," "how much," and "why."

Such a form of accounting is possible when there are standards as to costs and overheads, and the variations between standards and actuals determined and classified under proper headings.

Covering manufacturing and sales-capacity profits and losses, the manufacturing and sales overheads should be compared, as stated before, against standards determined for the "cyclical normal point" in a business (at 67 per cent on Profitgraph shown in frontispiece). In this connection, refer to section "A Study in Unit Costs," in Chap. X, as well as to Chart 24.

This form of accounting is known as "variation accounting" and will be used more and more in industry as executives realize its possibilities. It will permit monthly meetings called by the chief executive, when relative contributions to profit and loss can be discussed with and by sales manager, purchasing agent, factory superintendent, chief inspector, head of engineering work, controller, and others. *A profit clinic will be the result.*

WHAT THE VARIABLE BUDGET AND VARIATION ACCOUNTING REVEAL

Let us assume that the chief executive and the controller of the hypothetical situation we have been considering in previous chapters are in conference regarding the variations from sales and profit course shown on Profitgraph (frontispiece). Let us assume also that this Profitgraph and the income statement (showing variations) for the first quarter of the year are before them.

Let us further assume, in order to make this study of greater value to the reader, that instead of business' being on the 82 per cent line as shown in frontispiece it has really fallen to the 65 per cent capacity line.

Here is the variable budget, projected for the year, covering the 65 per cent situation:

PROFIT ENGINEERING

<i>Sales income</i>	\$3,900,000
<i>Material</i>	\$1,181,000
<i>Labor</i>	546,000
<i>Total</i>	\$1,677,000
<i>Variable manufacturing expense</i>	\$ 409,500
<i>Variable administrative expense</i>	161,850
<i>Variable selling expense</i>	468,000
<i>Total variable cost</i>	\$1,039,350
<i>Grand total variable cost</i>	\$2,716,350
<i>Total fixed cost</i>	637,802
<i>Total cost of sales</i>	\$3,353,652
<i>Operating profit</i>	\$ 546,348
<i>Excess outgo</i>	\$ 43,333
<i>Business profit</i>	\$ 503,015
<i>Interest</i>	75,000
<i>Taxable profit</i>	\$ 428,015
<i>Income tax</i>	55,642
<i>Surplus profit</i>	\$ 372,373
<i>Preferred dividends</i>	\$ 75,000
<i>Common dividends</i>	200,000
<i>Reserves</i>	50,000
<i>Total</i>	\$ 325,000
<i>Retained profit</i>	\$ 47,373

The comparison of this statement with that for the fixed budget for current year, with consideration given to the variation profits and losses, gives the real picture before these men in cold, hard facts:

Items	Fixed budget	Variable budget at current position	Variation
<i>Sales income</i>	\$4,500,000	\$3,900,000	\$600,000
<i>Standard cost of sales</i>	3,771,552	3,353,652	417,900
<i>Standard profit</i>	728,448	546,348	182,100
<i>Variation from standard cost of sales</i>..	.....	85,000	85,000
<i>Net actual profit</i>	728,448	461,348	267,100

CONTROLLING TO "ASSURE" PROFITS

The income statement which shows the cost variations reads as follows:

Sales at budgeted prices.....		\$3,900,000
Standard cost of sales.....		3,853,652
<i>Standard profit</i>		\$ 546,348
<i>Variations from Standard:</i>	<i>Losses</i>	
Price concessions.....	\$ 25,000	
Purchasing gains.....		20,000
Manufacturing-capacity losses.....	10,000	
Sales-capacity losses.....	5,000	
Material waste.....	10,000	
Labor waste.....	25,000	
Quality waste.....	15,000	
Financial gains.....		15,000
Other variations (classified).....	30,000	
Totals.....	\$120,000	\$ 581,348
Deduction of losses.....		120,000
<i>Net actual profit</i>		\$ 461,348
Excess variations losses over gains (\$120,000 less \$35,000)		85,000
Standard profit at current position.....		\$ 546,348
Loss in profit due to reduced sales volume.....		182,100
<i>Standard profit at fixed budget</i>		\$ 728,448

It will be seen from this latter compilation how the variable budget ties into the fixed budget.

Analyzing these records further from the standpoint of the owner's position covering profits left for common dividends, reserves, and additions to surplus, we have this statement:

Profit items	At fixed budget	Current position
Excess other outgo.....	\$ 50,000	\$ 43,333
Interest.....	75,000	75,000
Income taxes.....	78,448	55,642
Preferred dividends.....	75,000	75,000
Total.....	\$278,448	\$248,975
For common dividends, reserves, and surplus..	450,000	297,373
<i>Operating profit</i>	\$728,448	\$546,348

PROFIT ENGINEERING

With the various relationships brought to a focus, here are the comparisons:

Sales at 65 per cent of capacity instead of 75 per cent.

Decrease in sales 13.33 per cent instead of at 0 per cent.

Increase in actual costs over standard costs 15.55 per cent instead of at zero per cent.

Relation of net actual profit to fixed budgeted 63.33 per cent instead of at 100 per cent.

Capital employed turnover at 0.52 to 1.0 instead of at 0.60 to 1.0.

Surplus profit in sales dollar 9.55 cents instead of 11.67 cents.

Surplus profit to net worth 7.09 per cent instead of 10 per cent.

Shrinkage in owner's profit 36.14 per cent instead of at 0 per cent.

It will be seen from this study that the business ship is well off the plotted course, both as to sales and profits, but thanks to profit planning and control this fact is known sufficiently in advance of the journey's end (Dec. 31 of ensuing year) for the management of this hypothetical situation to do something about it.

THE "PROFITMETER"

The need for the various gauges in the boiler room and engine room, and in automobiles and airplanes, are well-known to readers of this text. We realize not only that they are highly informative but that disastrous results would follow any refusal to heed the warnings when the indicators pointed at or beyond certain marks.

While at first it may seem far-fetched even to suggest it, is not the work of profit making of sufficient importance to warrant a business in having its complement of recording devices, in what may be termed a business "pilot house?"

With this thought in mind, the author presents his "profitmeter" (Fig. 30), showing the variations from normal or desirable allowances in the situation just reviewed. It is purely suggestive, both as to arrangement and as to the factors to be covered by the recordings.

ABSORPTION OF FIXED COSTS IN RELATION TO PROFIT CONTROL

A study of the relative absorption of fixed costs is suggested as a means of increasing volume of sales, or

CONTROLLING TO "ASSURE" PROFITS

KNOEPPLE PROFITMETER

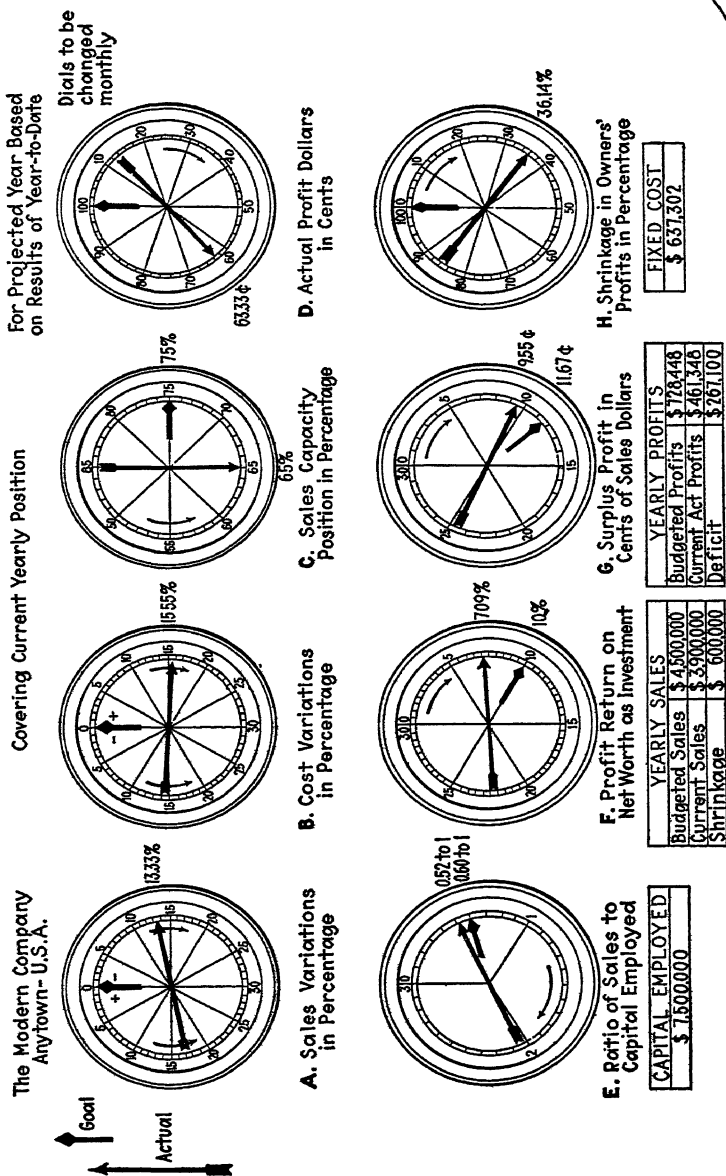


FIG. 30.

PROFIT ENGINEERING

lowering costs by manufacturing saleable products for stock, or both. To aid in this study, a charting is suggested such as is indicated in Fig. 31.

As will be seen, a line is drawn from zero capacity, to, through, and beyond the intersection of the "cyclical normal line" and the total cost line. The cyclical normal line, it will be remembered, is the line at which fixed overheads should be standardized, and standard prices for products determined.

At zero capacity there is no absorption of fixed costs; at normal capacity there is full absorption; while beyond the normal line there is overabsorption. From the normal

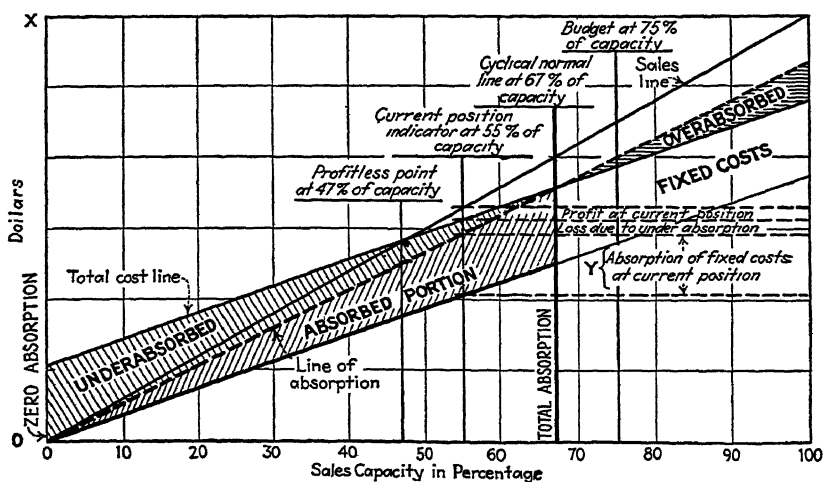


FIG. 31.—Analysis of fixed cost absorption.

line down the capacity scale, the fixed cost area is divided into two parts:

- A. Underabsorbed fixed costs above the absorption line.
- B. Absorbed fixed costs below the absorption line.

It will also be seen from this study that at the current-position line (the projection for the fiscal year or current twelve months) there is a loss due to underabsorption slightly greater than the profit indicated by the profit area. The relative amount of absorption at the current-position line is

CONTROLLING TO "ASSURE" PROFITS

also indicated. Please observe also that at budget the extra profit due to overabsorption is approximately equal to the loss due to underabsorption, as shown by the current indicator.

The matter for us now to consider is, What can be done at least to reach the normal line and make the profit shown at that point? Please keep in mind that at the rate the business is now progressing the showing for the year will be as indicated by the current-position line, where loss due to underabsorption slightly exceeds the profit shown on that line.

This means that the year will pick up the greater part of the fixed costs as indicated by the wording at *y*. Consequently, all that remains to be absorbed for the remainder of the year in some way is the amount that would otherwise be a loss due to underabsorption.

One of the things we can do is to manufacture saleable lines for stock if the carrying charges are less than the gains that would flow by lifting the volume above the normal line.

On the other hand, if a good part of the year has passed, and the future seems to indicate that the current indicator is at or near the logical point on the capacity scale, then some saleable regular lines can be specially priced, by adding material, labor, and variable overheads, plus the loss that would otherwise be sustained by underabsorption, plus profit. If a higher price than this will induce buying, a greater part of fixed costs can be added.

Let it be stated again that, at the normal line, the volume for the year will absorb the indicated fixed costs. Having already been absorbed, they do not have to be absorbed again and, under certain conditions, can be ignored if volume can be raised to and beyond the normal line, thus adding to profits.

Or, if possible, a modified line of products can be developed, specially priced, and specially merchandised, to accomplish what we are after. The following tabulation illustrates what is meant:

PROFIT ENGINEERING

50,000 units regularly marketed @ \$100 per unit..... \$5,000,000

Costs:

Material @ \$35 per unit

Labor @ 15 per unit

Overhead @ 25 per unit

Total \$75 per unit as variable cost multiplied by

50,000 units..... \$3,750,000

Fixed costs..... 850,000

Total cost..... \$4,600,000

Profit..... \$ 400,000

50,000 units sold at \$100..... \$5,000,000

10,000 units *modified and specially merchandised* at \$85 per unit.... 850,000

Total income..... \$5,850,000

Variable cost at \$75 per unit for 60,000 units..... \$4,500,000

Fixed costs 850,000

Total cost..... \$5,350,000

New profit..... \$ 500,000

Additional profit..... \$ 100,000

Increase

Percentage

In units..... 20

Sales volume..... 17

In profit..... 25

PROFIT AND LOSS BY LINE OF PRODUCT

A number of years ago the author studied a business made up of boiler shop, machine shop, and foundry. The boiler shop manufactured a general line of structural work, mostly to specifications. The machine shop manufactured gas engines and a line of oil-well drilling machines. The foundry served both boiler shop and machine shop. All three divisions were considered as one entity in the books of accounting of the company—which was losing money.

One of the betterments inaugurated was to place each division on its own feet through a change in the cost and accounting systems, so that each had its own profit and loss statement.

CONTROLLING TO "ASSURE" PROFITS

The result was a surprising one—as to both costs and prices—and a number of changes were made covering both the addition of some new lines and the elimination of old ones. The gas-engine business was discontinued entirely as it was found to be the chief contributor to losses made by the company; the boiler shop was considerably enlarged and enjoyed a profitable record thereafter; and even the foundry was conducted on a more efficient basis after profit and loss statements covering its monthly operations were given to its management.

Profit and loss analysis was one of the most important factors in the later progress of this company—which now was making money.

In another case coming under the author's observation—a large structural shop manufacturing boilers and tanks—it was found that sales of tanks were declining. When accounting by lines was inaugurated, it was found that the tank business was carrying a cost loading altogether too heavy. The boiler business was showing excessively large profits due to undercosting certain elements. A readjustment resulted in an increase in tank sales without any loss in sales of boilers.

In a plant manufacturing sash and doors, as well as interior trim, it was found that sash and door sales were falling off. After profit and loss accounting by lines, it was found that money was being lost on interior trim, while business was being lost on sash and doors, owing to incorrect costing and pricing in both departments. A readjustment led to decreased costs and prices on sash and doors, and larger sales resulted. The increase in costs and prices on interior trim did not interfere with sales, which sales were profitable.

Let us take a simple illustration more forcibly to bring out the importance of this work of profit and loss analysis. Assume that two lines of product are covered as one in the accounting records, as follows:

Cost.....	\$294,000
Sales.....	292,500
<hr/>	
Loss.....	\$ 1,500

PROFIT ENGINEERING

Let us now take these two lines and consider them separately, as follows:

Item	A		B
Sales.....	\$160,000	.....	\$132,000
Cost.....	188,000	.....	106,000
Profit or loss.....	\$ 28,000	.....	\$ 26,500
Net loss.....	.....	\$ 1,500	

In Fig. 32 are shown simple Profitgraphs covering these two cases, which present graphic evidence of real value. With smaller sales volume, the profitable line has a cross-over point of 40 per cent, with sales on the 66 per cent line; while the larger sales volume has a 56 per cent crossover point, with sales on the 40 per cent line. It is evident that the profitable line should be "pushed," while in the case of the losing line both cost reduction and greater volume are badly needed.

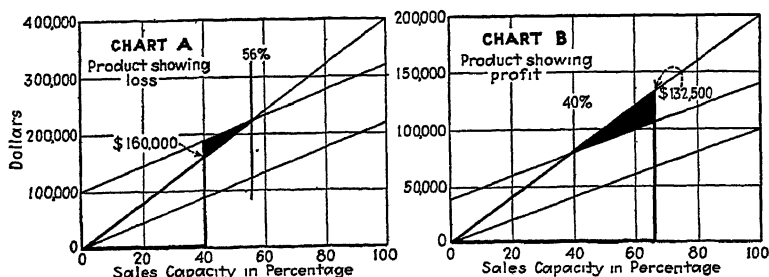


FIG. 32.—Profits and losses by lines of product.

It would amaze many manufacturers, who do not know their profits or losses by product lines, to find out what can be done in the way of improving lines and effecting cost reductions, as well as developing more scientific pricing, when once accounting is changed to admit of a better knowledge of costs and profits and losses by product lines.

SALES COSTING AND STATISTICAL WORK

A technique analogous to production costing is coming into the picture for sales work. If the sales cost in the sales

CONTROLLING TO "ASSURE" PROFITS

dollar is twenty cents, it is recognized that this is merely an average, for something may cost thirty-five cents to sell, with something else costing five cents. There have been cases where the sales cost ran from fifty cents to seventy cents of the sales dollar. A blanket figure will not do. Sales overhead will also be handled on an over- and underabsorbed basis, the same as is now the case with manufacturing overhead.

The author is convinced that there are greater possibilities in the analysis of sales-expense costs than in that of factory-expense costs.

In two cases—one bicycles and the other hardware—decisions to discontinue these lines owing to low profits were reconsidered when the effects of these products as "sponges" for absorbing overheads were cited, as against loading those absorbed overheads on other products in case these lines were dropped. Economic considerations, rather than the blind worship of accounting principles, must govern sales work in the future.

We well remember the apoplexy which affected a Cost Department when it was recommended that an order be taken for labor, material, variable overhead, and profit, on the theory that production "as was" would absorb all of the "fixed" costs anyway, and that there wasn't any for the order in question to absorb. What we need is fewer "human adding machines" and more accountants and engineers with the common sense to see things from the standpoint of the economic needs of a business.

With the excellent technique which has been built up through the use of mechanical punching, sorting, and tabulating equipment, more and more real sales statistical work will be possible, from which will flow a real work in determining better merchandising policies. The knowledge a Sales Department has is no better than its facts, and the gathering of facts quickly and cheaply is one of the greatest needs of the day in selling—one which the modern tabulation equipment can supply.

PROFIT ENGINEERING

GRAPHIC SALES COMPARISONS

A sales budget was once set at \$3,000,000 for a well-known firm, as the *needed* sales to better the profit position of the company. The Sales Department felt \$2,500,000 was about all that could be expected in the way of sales volume. At the end of the budget period, sales amounted to \$3,266,000.

One of the elements in this result was the development and use of a series of charts (see Fig. 33), which were sent

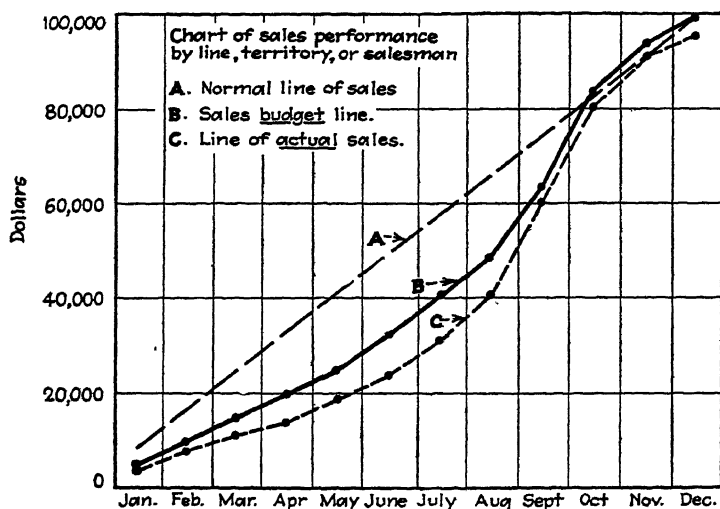


FIG. 33.—Sales charts.

weekly to salesmen in the various territories, covering their sales by product lines and in total. These charts enabled them to visualize the relation of their actual results to the goal set up for them. They were able, thereafter, to play against their own game.

OTHER FACTORS FOR PROFIT CONTROL TO CONSIDER

Many other things could be outlined as being within the province of the function of profit control to consider, but lack of space prevents other than topical mention, as follows:

- Reduction of inventory of raw materials.
- Speeding up turnover of work in process.

CONTROLLING TO "ASSURE" PROFITS

More rapid disposition of finished products.
Intensive follow-up of receivables.
Sale of surplus equipment.
Analysis of lost sales by causes, products, salesmen, and territory.
Salvage of scrap, obsolete, and excess materials.
Discounting of bills.
Renting of unused floor space.
Working plant or department two or three shifts.
Using women in place of men on some operations.
Subletting part of the work plant; is not equipped to manufacture economically.
Improvements of methods and processes.
Rearrangement of departments and plant.
Further extension of incentive plans.
Further waste-elimination studies.
More standardization.
Greater simplification.
Extension of research.
Make additions to equipment, add new buildings, make major repairs and replacements, and the like, in periods of low prices, prompt deliveries, and plentiful labor.

THE NEED OF FACTS—ALL THE FACTS

Rockne, in speaking of his "chart of play" or "control plan," once said:

Sometimes we feel like tossing that chart away and saying, "Oh, well, we won again, we've got a good team, and we ought to win again next week." But we've learned, by sad experience, that in competition as keen as football we can't keep winning unless we keep improving, and we can't improve unless we have the *facts*—all the facts.

The function of profit control is to secure, analyze, and *interpret* facts—all the facts.

CHAPTER XIII

WATCHING THE DOLLARS AT WORK

The *balance sheet* and *income statement*, together with the supporting statistics, are the final measures of the effectiveness of general and financial management, and particularly of economy and efficiency in the use of capital. These financial statements are expressions of fundamental business relationships, and financial and operating statistics should be read with a view of determining these relationships. The facts given in the statements mean little until their relationships are considered, for these are the *measurement of business efficiency*. The amount of inventories, plant investment, or current liabilities may be interesting, but the more important facts to be noted are the proportions of capital so represented, the turnover of inventories, turnover on plant investment, and ratio of current assets to liabilities.—J. H. BLISS, on "Management Ratios," in "Management's Handbook" (Ronald Press).

Medical practitioners have developed a technique of examination which enables them to determine what is wrong with the human body and why, as the basis for prescribing necessary remedies. They consider pulse, temperature, blood pressure, blood count, blood color, stomach, teeth, nose, throat, and other factors—all, however, with reference to the human body as a whole.

Of late years, business has been developing something akin to the work of medical specialists in what is known as the "ratio analysis." The theory behind this development is that balance sheets and income statements contain a number of items which either do or do not bear a proper relation to one another or to the whole. If relationships are normal, a business is in a "healthy" condition. If there are wide variations from normal, not only is it possible to diagnose the business as "sick" but the reasons for the illness can be pointed out, and the proper remedies can be developed and prescribed.

In 1921, while at work in a professional capacity for a large firm, the author had to approach the problems before the company from financial and sales angles. One of the first steps was to prepare a "financial analysis." From that time, there have been many revisions of the practice then initiated, culminating in the technique described briefly in this chapter.

Much good material has already been published dealing with financial analysis, notably "Financial Ratios," by Bliss; "Analyzing Financial Statements," by Gilman; "Corporation Profits," by Sloan; and "Main Street and Wall Street," by Ripley; not overlooking the able work of Alexander Wall, of the Robert Morris Associates; reports of United Typothetae; articles in *Harvard Business Review*; data in handbooks published by Ronald Press; and other sources; to all of which the author is deeply indebted for inspiration and guidance.

Without going into the evolution of the present technique (which might be changed tomorrow if refinements suggested themselves), it might be well to state that definite flaws were found in a ratio analysis which did not take into account the percentage of "components" to totals, like cash to liquid assets, or current assets to total assets. Then it was found that using only percentages of parts to the whole did not furnish the true picture of "relationships"—such as ratio of liquid assets to current liabilities, or surplus profits to the net worth.

It was also observed that a complete treatment of components and relationships resulted in a presentation which seemed more of a task than many cared to undertake, even though the results would have justified the means. The problem, therefore, was to attempt to develop a more direct treatment, so as to bring about a greater interest in this important work of "watching the dollars at work," as well as greater application of it to the vital problem of bettering a given profit position.

PROFIT ENGINEERING

ANALYSIS OF BALANCE SHEET AND INCOME STATEMENT AS SEPARATE DOCUMENTS

Throughout this book treatment we have again and again stressed the importance of relating actual results to standards, so as to observe variations as a basis for inaugurating management betterments. This principle of determining effectiveness applies with equal, if not greater, force to the study of financial records, because of the important part such records play in the conduct of a business.

In the third chapter "The Importance of Financial Records in Profit Making," two exhibits were shown (Figs. 1 and 2), covering suggested arrangements of balance sheet and income statement.

These exhibits should be reviewed at this point, preparatory to the recommendation that an additional column be placed at the right of the assets and liabilities sides of the balance sheet, and of the income statement. The two extra columns on the balance sheet should carry the phrase "desirable range," while the extra column on the income statement should carry the word "budget."

In these columns should be placed the ranges and budget allowances, which a given management should develop as standards for its own needs. It would then be possible to make comparisons between standards and actuals and then note the variations from the allowances determined upon.

As will be noted by referring to the balance sheet (Fig. 1), the arrangement facilitates a cross reading, and a determination of such important relationships as liquid assets to current liabilities, and current assets to current liabilities. With the addition of columns for desirable ranges, the exhibit becomes doubly valuable, as progress, or lack of it, can be noted. Take the case of the inventory position as 30.6 per cent of the assets. If the allowable range carried an allowance of 25 per cent, we would at once know that the inventory was greater than it should be.

It will also be seen that the vital component "net worth" to total assets (82.7 per cent) is an integral part of the

WATCHING THE DOLLARS AT WORK

record when percentage columns are shown. If, in addition, we place in a desirable-range column the range previously determined upon, namely, 80 to 72 per cent, we see at once that the given showing is better than the allowance given.

In like manner other important factors can be considered, such as relation of net worth increment over capitalization, net worth to both current and noncurrent liabilities, relation of common to preferred stock

The same reasoning applies to the matter of studying the income statement, carrying its columns for actual and budgeted cents of the sales dollar.

Budgeted Sales Dollars, 100 ¢					OPERATING PROFIT 16.19	
Cost to Manufacture and Sell, 83.81 ¢					BUSINESS PROFIT 5.06	
Manufacturing Cost, 56.55 ¢			Commercial Cost, 27.26 ¢		TAXABLE PROFIT 3.42	
29 ¢	14 ¢	13.55 ¢	10.82 ¢	16.44 ¢	SURPLUS PROFIT 1.67	
					7.21	4.46
Direct Materials	Direct Labor	Manufacturing Expenses	Administrative Expenses	Selling Expenses	RETAINED PROFITS	
					Dividends and Reserves	
					Net Income	
					Taxes and Profits	
31 ¢	15.50 ¢	14.50 ¢	12 ¢	18 ¢	4 ¢	1 ¢
					SP	5 ¢
					TP	6 ¢
Manufacturing Cost, 61 ¢			Commercial Cost, 30 ¢		BP 7.5 ¢	
Cost to Manufacture and Sell, 91 ¢					OP 9 ¢	
Actual Sales Dollars, 100 ¢						

FIG. 34.—Graphic income statement.

If, from these usually static presentations, which have now become dynamic through reducing the factors to a common denominator, and then comparing the detailed results against allowances, we now plot the values in the form of bar charts—one hundred spaces (ten to the inch) in length—we can then “visualize” the relative positions on income statement (Fig. 34) and relative position of both items and relationships as between assets and liabilities on the balance sheet (Fig. 35).

PROFIT ENGINEERING

It will be readily seen that, by the use of statements and graphs, we really make financial analysis a relatively simple matter.

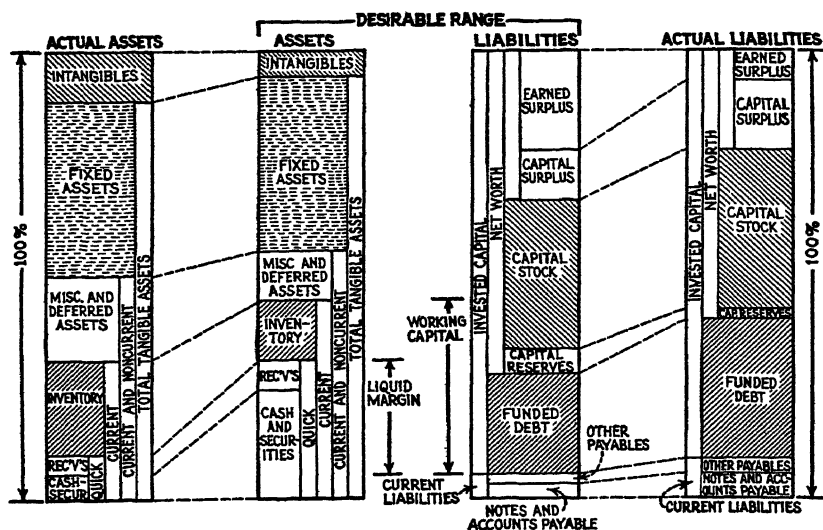


FIG. 35.—Graphic balance sheet.

ANALYSIS OF BALANCE-SHEET AND INCOME-STATEMENT RELATIONSHIPS

So far we have considered the balance sheet and income statement as separate entities. We now come to the matter of considering various elements with reference to each other. In this consideration two factors come to the front:

1. Profits.
2. Turnover.

With reference to profits, these relationships are suggested, the values being taken from Figs. 1 and 2.

- ### 1. Management's gauge:

$$\frac{\text{Operating profit—\$300,000}}{\text{Tangible assets—\$1,469,360}} = 20.42 \text{ per cent}$$

- 2. Owner's gauge:**

$$\frac{\text{Surplus profit—\$185,500}}{\text{Tangible net worth—\$1,214,234}} = 15.28 \text{ per cent.}$$

WATCHING THE DOLLARS AT WORK

3. Margin on cost:

$$\frac{\text{Operating profit—\$300,000}}{\text{Cost to make and sell—\$1,600,000}} = 18.75 \text{ per cent}$$

4. Left for owners:

$$\frac{\text{Surplus profit—\$185,500}}{\text{Business profit—\$231,500}} = 80.01 \text{ per cent}$$

5. Retained for business:

$$\frac{\text{Retained profit—\$148,500}}{\text{Surplus profit—\$185,500}} = 80.06 \text{ per cent}$$

6. Times interest earned:

$$\frac{\text{Business profit—\$231,500}}{\text{Interest on borrowings—\$13,000}} = 17.81 \text{ times}$$

7. Owner's relative dividends:

$$\frac{\text{Common dividends—\$25,000}}{\text{Preferred dividends—\$12,000}} = 2.083 \text{ to } 1$$

8. Mark-up over manufacturing cost of sales:

$$\left(\frac{\text{Sales (net)—\$1,900,000}}{\text{Manufacturing cost of sales—\$1,230,000}} \right) - 100 = 54.79 \text{ per cent}$$

By placing budgeted allowances covering a given business to the side of these relationships, a study of this kind would be extremely valuable.

CAPITAL AND TURNOVER

There are two questions usually in the mind of the average business man as soon as the financial records for a given period are available:

1. What were our sales?
2. How much profit did we make?

While not unmindful of the importance of sales and profits, as the previous chapters have so conclusively indicated, the author wishes to call attention to the fact that, from certain angles, considerations of capital and turnover

are even more important, because they exercise such a powerful influence on profit making.

A case in point will illustrate what is in mind. A manufacturer of ladies' underwear once said that he was having difficulty in pricing his lines. In one plant he made rayon underwear, while in another he made cotton goods. He was asked if he had ever considered the matter of relative turnover of his two lines. He wanted to know what was meant. The author then asked him if he would add 10 per cent to his costs if in one plant he manufactured high-grade ladies' watches, and ice cream in the other? He thought a minute and then said that if he added 10 per cent to the cost of the watches he would lose money, owing to the slow turnover in watch manufacturing, while he would be unable to sell ice cream as 10 per cent profit in price would be too much because of the unusually rapid turnover. He realized that he would need a large profit on watches, while on ice cream a very small profit per quart would be sufficient. By visualizing the effects of these tremendous extremes, he was able clearly to appreciate the meaning in the difference in turnovers in his plants, when it came to the matter of what profit to add to cost to make price.

If we are correct in our assumptions that profits should be related to assets and net worth, and that we should determine the profit in the sales dollar by way of the capital-turnover route, then capital and turnover deserve far more attention than is usually given to them.

If, to a large capital, we add a sluggish turnover, we place an unusually heavy burden on a Sales Department in asking it to sell products for prices which will net the profits required through the use of our profit formula.

The balance sheet, then, should be given as much attention in our considerations of profit engineering as the income statement, because it presents the capital picture in detail, with reference both to its distribution and to the sources from which it comes. Sales bear a direct relation to this balance sheet through turnover calculations. Obviously, a situation is bettered if, with the same capital, we can

increase our sales or secure the same sales with less capital. Inasmuch as it is not easy to get greater sales in times like these, the matter of less capital to "speed the turnover" is a vital one in industry today. For this reason executives are watching, as never before, the matter of the turnover of receivables, of plant, and especially of inventory, for, the smaller these are relative to the sales income, the less relative profit is necessary in the sales dollar.

Furthermore, it is recognized that capital is made up of variables as well as fixed factors, which need to be taken into consideration if there is to be an accurate development of turnover relationships. It is true, of course, that the balance sheet has less variable and more fixed values than does the income statement, but the fact remains that capital is both fixed and variable and should be so treated in profit making.

With this in mind—patterned after the Profitgraph—the Knoepfel Turnovergraph, or "variable balance sheet," was developed both to picturize fixed and variable capital and in addition to furnish a graphic analysis of capital turnover. This Turnovergraph is shown in Fig. 36.

In essence, the dollar values covering fixed and variable capital are plotted against a sales-volume scale, on which is superimposed the line of net sales. The net worth and working-capital lines are also indicated on the chart to make the showing complete.

To the left of the chart are readings from the sales line indicating the sales necessary to make one turn yearly, of net worth, operating capital employed, and total capital.

To the right of the chart is a turnover reading as shown by Figs. 1 to 8, which key with circled figures indicated at different points on the charts. These turnover figures are shown as ratios and then in terms of the months necessary for each item to make one turn.

The capital is separated between operating and financial assets, so as to relate an operating result—net sales—and the corresponding operating capital necessary to secure it. This capital division, in itself, will do much to put Sales

PROFIT ENGINEERING

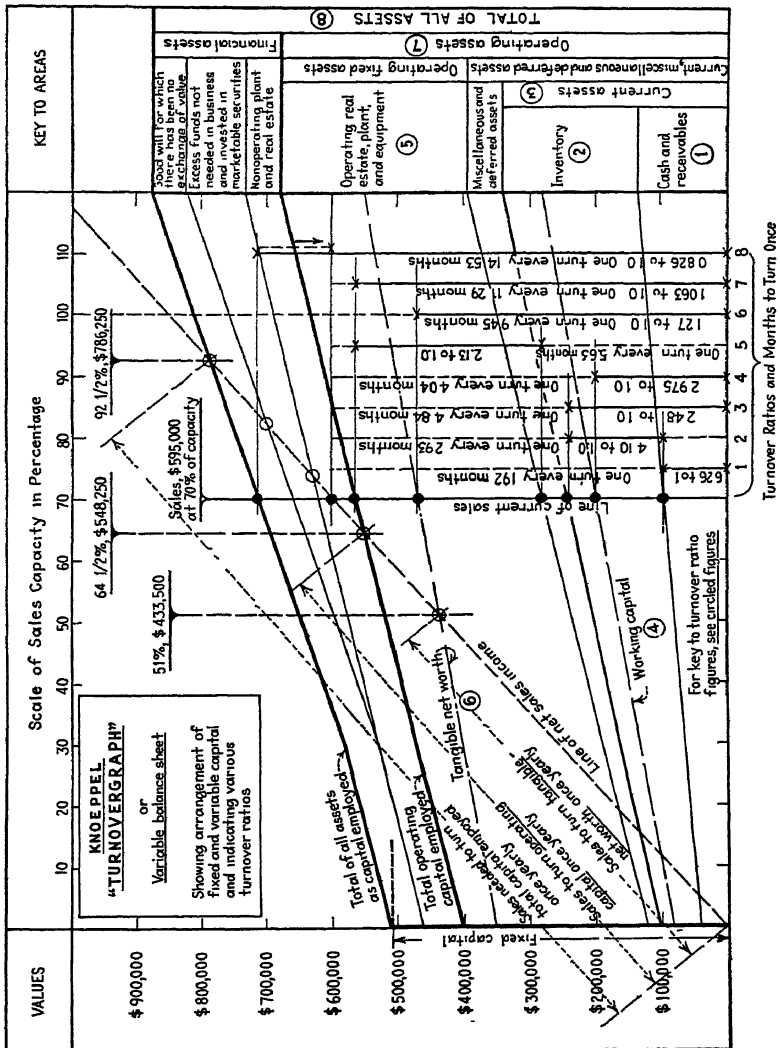


Fig. 36.

WATCHING THE DOLLARS AT WORK

Departments in a position better to compete in these times, for, as the chart shows, it is hard to justify a request for \$786,250 in sales, at one turnover of all assets, when one turnover of operating capital calls for only \$548,250 in sales, which goal the Sales Department has bettered in turning in sales of \$595,000.

As a means for planning the increase or decrease of capital as volume rises and falls, and for making analytical studies leading to reductions in capital to speed turnover, the Turnovergraph is considered to be a fitting companion to the Profitgraph, thus bringing together graphic presentations, on a variable basis, of both balance sheet and income statement.

A SUGGESTED SEQUENCE

There is no limit to which this matter of financial analysis can be carried, but there should be basic readings which would constitute what should be considered as highly essential.

In attempting to indicate a sequence as to this, the author merely voices his own opinion, and not something that is as final as one plus one equals two. He would place the emphasis on this order of elements:

1. Strength of owner equity.....Tangible net worth as the best index of the real strength of a business
2. Turnover.....Sales to inventory, plant, tangible net worth, and operating capital employed
3. Earnings.....Surplus profit on tangible net worth, and operating profit on operating capital employed
4. Disposition of earnings.....Surplus profit to business profit, and retained profit to surplus profit
5. Ability to meet obligations.....Liquid assets (cash and receivables) to current liabilities
6. Inventory position.....Relation of inventory to the current assets, and to total assets
7. Fixed-assets position.....Relation of fixed assets to total assets, and to the capital stock
8. Surplus position.....Relation to total assets, and to working capital
9. Relative ownership.....Common-stock holdings to the preferred holdings
10. Conservatism of management.....Provision for reserves other than those for bad debts and depreciation

PROFIT ENGINEERING

FINANCIAL ANALYSIS					
Definition	Element in ratios	Allowable range, per cent	O. K., per cent	Out of range per cent	Comment
A. Sales ratios:					
1. Vitality of capital employed	Net sales:	100-200	.....	84 6	
2. Investment activity..	Capital employed	150-300	.....	128 5	
3. Vitality fixed assets.....	Net sales:	200-400	.....	204 3	
4. Effectiveness of working capital....	Net worth	400-600	...	365 0	
5. Inventory turnover.....	Fixed assets	500-800	.	376 5	
6. Collection efficiency...	Net sales:	600-1000	793.0		
	Inventory				
	Net sales:				
	Receivables				
B. Profit ratios:					
1. Earning power of capital employed.	Operating profits:	13 50	....	10 0	Profit efficiency 74 07%
2. Earnings on sales	Capital employed	15 95	...	11.92	
3. Earnings on invested capital.....	Operating profits:	20 60	.....	15.37	
4. Earnings on capital stock.	Net sales	34 00	....	25.75	
5. Business protection.....	Surplus profits:	25-40	29 5		
	Net worth				
	Surplus profits:				
	Capitalization				
	Retained profits:				
	Surplus profits				
C. Asset ratios:					
1. Creditor protection.....	Current assets:	250-500	....	235.0	
2. Working-capital position.	Current liabilities				
3. Collectibility..	Working capital:	20-35		23.1	
4. Liquidity of inventory....	Capital employed	20-40		30.7	
5. Inventory position.....	Cash:	30-50		47.5	
6. Quick position.....	Receivables	15-30		22.4	
7. Frozen position.....	Receivables:	12 1/2-25		17.9	
8. Intangible position....	Inventory	40-55		41.5	
	Inventory:	5-15		12.5	
	Capital employed				
D. Liability ratios:					
1. Liquid position.....	Cash and receivables:	12 1/2-25		19.0	
2. Debt liquidation.....	Current liabilities	100		104.0	
3. Creditor position.....	Liquid assets:	20-35		17.2	
4. Ability to meet obligations	Current liabilities:	20-35	.....	61.5	
5. Secured debt.....	Source of capital	200-300		342.0	
6. Margin over capitalization	Notes payable:	150-300		164.5	
7. Surplus strength..	Current liabilities	20-40		25 6	
8. Working-capital protection.....	Fixed assets:	100		111.0	
	Secured debt				
	Net worth:				
	Capitalization				
	Surplus:				
	Capital employed				
	Surplus:				
	Working capital				

FIG. 37.

WATCHING THE DOLLARS AT WORK

A COMPLETE FINANCIAL ANALYSIS

There may be those who desire to make a fairly complete set-up of components and relationships, either independent of or in conjunction with the exhibits herein presented. To aid in this, the arrangement shown at Fig. 37 is offered merely as a suggestion.

TANGIBLE NET WORTH

The author advocates a seemingly radical treatment of net worth, from the standpoint of intangibles for which there has been no exchange of value. On the assets side of the books these intangible items should be excluded to give us a tangible assets figure. They can then be added back to indicate the total assets. A corresponding treatment is necessary on the liabilities side.

To illustrate, the following case material is offered, taken from the published records of a large and well-known company:

First preferred stock.....	\$ 4,163,100
Second preferred stock.....	5,000,000
<hr/>	
Total preferred stock.....	\$ 9,163,100
Common stock.....	6,423,850
<hr/>	
Capital stock.....	\$15,586,950
Reserves and surplus.....	2,410,040
<hr/>	
Net worth.....	\$17,996,990

In the assets, however, there is an item for patents and development and organization expenses, amounting to \$2,977,660. This means that the tangible net worth is \$17,996,990 less \$2,977,660, or \$15,019,330.

We can look upon this in two ways—as an impairment of capital stock:

Capital stock.....	\$15,586,950
Tangible net worth.....	15,019,330
<hr/>	
Impairment.....	\$ 567,620

PROFIT ENGINEERING

or, if we leave the capital stock as it is, then the surplus becomes a red \$567,620.

The intangible factor would be added back to tangible net worth to make total net worth, as follows:

\$15,019,330
2,977,660
\$17,996,990

In this way a management can see things in terms of net values on which profit should be related, and the owner of securities can ascertain exactly where he stands as to his real equity in a business.

THE STORY OF NASH

In *Barron's Weekly* for June 6, 1932, there was this statement: "Nash Motors, one of the strongest financially, if not the strongest, of all motor car manufacturers."

In support of this statement, and as an indorsement of financial analysis study, the following is offered, from the 1931 fiscal statements:

Item	Relation- ship	Position in eleven in list
Turnover of fixed assets.....	5.27 to 1	1
Inventory:		
To current assets.....	3.4 %	
To total assets.....	0.277 %	1
Cash and government securities:		
To current assets.....	96.4 %	1
To total assets.....	75.8 %	
Current assets to current liabilities.....	14.68 to 1	1
Profit on sales.....	13.38 %	1
Relative position as to sales.....	.....	Seventh

STARTING THE WORK

A management desirous of "watching the dollars at work" should begin by developing its financial statements and charts along the general lines suggested herein, in order

WATCHING THE DOLLARS AT WORK

to observe the actual components and relationships. While this is being done, it should be the work of some division—preferably the controller's division—to begin the task of establishing desirable ranges as to assets and liabilities factors, and budget allowances covering sales-dollar components, as well as the allowable ranges covering relationships between the pertinent income-statement and balance-sheet items. The result would be a basis for financial analysis which would be of extreme value in bettering the ultimate profit result.

CHAPTER XIV

ECONOMIC FACTORS GOVERNING PROFIT MAKING

There will be, as there always has been, a tendency to forget the dangers of unplanned, uncharted business during that inevitable next period of prosperity. We are the antithesis of those alleged ostriches who bury their heads in the sand when danger approaches; we are too prone to bury ours when all seems safe. Now, between-times, as it were, let us look back, think, and repair those economic walls while the impressions of past disaster are vividly in mind. Then, when the next sandstorm comes, we may be so strongly fortified that we shall not have either to bury our heads or to stand up and take it between the eyes.—LEE H. BRISTOL, in "Profits in Advance" (Harpers).

Fundamental changes in our economic, financial, managerial and operating concepts will be required.—From Introduction to "Waste in Industry," Report of the Hoover Committee on the Elimination of Waste in Industry¹ (McGraw-Hill).

The years 1930, 1931, 1932 have been years of severe business depression; years which have severely undermined our economic foundations; years which have taught many of our industrial and financial leaders that their much-vaunted "genius" for promotions, financings, and putting over "big deals" was in reality more in the nature of what can be termed "blissful ignorance."

It was expected that the lessons of the depression years 1920, 1921, 1922 would be remembered, but the so-called "Coolidge prosperity" made business men forget the difficulties of what is known as the "primary postwar depression."

We are starting to emerge from the secondary postwar depression, and it may well be that when the next great surge of prosperity and "bull markets" is upon us we will be

¹ It was the author's privilege to be a member of this committee.

FACTORS GOVERNING PROFIT MAKING

as forgetful as before. Yet there is some justification for the contention that this time it may be different, owing to the severity of our economic upheaval and its consequent trail of loss, stagnation, unemployment, and human misery.

Business men are beginning to realize as never before that there are such things as economic factors in business; that action and reaction *are* equal; that there *are* laws of business which cannot be violated any more than the laws of health, without paying the penalty for such violations.

There is, therefore, a growing feeling that business needs to be run along more scientific lines; in ways which will be more profitable for all parties concerned.

In an effort to be as helpful as possible in this respect, it was decided to include a chapter, not on the subject of "economics," but to cover some of the economic factors governing profit making, to which more and more attention must be given.

PRICING ON BASIS OF NORMAL CAPACITY

In the last analysis cost does not govern price. Cost is merely an expression of outlay. What can one get for his product in the open market is distinctly another matter. The formula, cost plus profit equals price, many times becomes price plus loss equals cost. Competition has a real voice in saying what price will be, and volume produced is one of the greatest economic factors in competition.

To illustrate: If I build a shop capable of producing 100 steel tanks per day, and I produce and sell only 20 tanks daily, should I try to get a price based on the latter quantity? Certainly not! The price would be far too high owing to the fact that one-fifth of the volume would be absorbing five-fifths of the overhead. I would, therefore, lose business if I priced on the basis of 20 per day. If, on the other hand, I produce and sell 125 tanks daily, owing to overtime work, should I price on the basis of 125 tanks? Again the answer is in the negative, for then my price would be too low, owing to absorbing my overhead for 100 tanks daily by $1\frac{1}{4}$ times my capacity volume, making

PROFIT ENGINEERING

my costs and, therefore, my prices, relatively less per unit. I would then be selling my goods for less money than I could get for them, which means losing money. The 20 per cent and 125 per cent productions reflect subnormal and abnormal conditions which usually are but temporary, while from 70 to 85 tanks per day is an "economic normal" which will be my basis for pricing. On no other basis can I adequately meet my competition.

PROFITS IN PROPORTION TO COMPLEXITY

We are entitled to the most profit for that which is most difficult to produce. This is an economic truth which none can gainsay. What then makes for difficulty? Material? No, for we merely act as brokers or jobbers, advancing the money and purchasing the material for which the buyer will reimburse us later. We act as his agent in purchasing his needs in the making of his goods. What costs is what the buyer's specifications call upon us to do in the way of work on his material, plus the cost of the many and varied items necessary for us to "facilitate" the work to be done—the cost of fabrication. These are the final gauges of "relative complexity," and in proportion to relative complexity should we receive a profit.

As an example, take the case of two steel plates of the same size and thickness and, therefore, the same cost on the material market. In one, we lay out and punch 100 holes, while in the other, 10 holes. The ratio of both labor and overhead is 10 to 1, hence, in theory at least, we should receive ten times the profit for the 100-hole job as for the 10-hole job. Why should a varying material content govern the profit charge when material in itself has no bearing on fabrication, while what we do to and with the material (for which the specifications are responsible) has every bearing upon it and should govern the margin of profit we should ask?

Profit, therefore, should be added to cost of labor and overhead, and not to total cost. We should proceed as if the buyer should say, "I will supply you with the material to

FACTORS GOVERNING PROFIT MAKING

avoid paying you a profit on it, although I am willing to give you a proper return on the real work I am asking you to do for me, which is to fabricate this material of mine through the use of your machines, your labor, and your facilitating overhead."

If this viewpoint is not accepted, then the prices for complicated work will be too low, which will cause losses, while the prices for simple and easy and tonnage work will be too high, which will mean a loss in getting business. The table below illustrates this principle:

Job items	Case A	Case B	Case C
Material.....	\$ 400	\$ 600	\$ 800
Labor.....	300 } 600	200 } 400	100 } 200
Overhead at 100%.....	300 } X	200 } X	100 } X
Total cost.....	\$1,000	\$1,000	\$1,000
Profit at 20%.....	200	200	200
Price.....	\$1,200	\$1,200	\$1,200

NOTE.—Profit is the same, yet X varies at 2 to 1 and 3 to 1.

Total cost.....	\$1,000	\$1,000	\$1,000
Profit at 50% on X	300	200	100
New price.....	\$1,300	\$1,200	\$1,100
Price change.....	+100	0	-100

NOTE.—Profit now varies as X in the ratio of 2 to 1 and 3 to 1.

Thus it will be seen that we must orient profits to the true investment in work—the complexity factor—which is labor and its facilitating overhead.

THE RELATION OF "REAL" DOLLARS TO FIXED-ASSET VALUES

Capital-asset values should not remain fixed, as representing what we paid for them at the time of acquisition. The rise and fall of wages, salaries, material costs, and interest charges are reflected in our costs and, therefore, in the prices we pay for goods. When it comes to the matter of capital assets, however, the ancient and musty accounting

rule is original cost less depreciation. A manufacturer once told me he was replacing a \$1,200 boiler with a \$4,200 one and wondered about the difference of \$3,000. When the matter was fully explained to him, he saw that part of the extra could be considered a capital outlay because he was not replacing a boiler of the same kind, but that for the larger part of it he would have to go to surplus because, over the years, he had failed to add more to his depreciation reserve, and hence to the prices which his customers would have paid. The author asked him this question: "Is it the investment in the property, or the property itself, that you want to replace when it is necessary to do so?" He answered that it was the property he wanted to replace.

Fixed-asset values should be allowed to rise and fall with the rise and fall in the purchasing power of the dollar, and depreciations should be adjusted yearly through the use of an index figure. In this way we would then get the fluctuations into cost; hence into price.

In the famous O'Fallon case before the United States Supreme Court, a principle of valuation was sustained that cost of reproduction cannot be ignored in the establishment of values. This is a forerunner of a change in practice in business with reference to this important point.

DEPRECIATION AS A DIRECT COST

If a manufacturer should rent his buildings and lease his machinery, he would see to it that, day by day, week by week, and month by month, the costs of rental and leasing would be allocated directly to the machines and floor spaces working on productive operations, and thence to the jobs being worked on. There is, in reality, no difference when the manufacturer, instead of renting his buildings and leasing his equipment, invests his capital for them. He is simply paying in advance for buildings and equipment, which, by the logic indicated above, forces the conclusion that the cost of capital in providing buildings, equipment, and facilities should likewise be charged

FACTORS GOVERNING PROFIT MAKING

directly to machines and floor spaces and allocated to the jobs being worked upon.

There is another way to look at this matter of use of capital assets. If workers and executives were to receive wages and salaries in advance for a period of ten years, the cost reports for the ten years would currently and accurately show the charges for wages and salaries, and they would be allocated directly to the jobs being worked upon.

Still another way of viewing this rather tantalizing issue in manufacturing is that the customer should pay, in price, for all the costs of the products he purchases, plus a proper profit. If depreciation is left out of the calculations, or if it is not included in the most intelligent manner, then the prices cannot include the proper amount of money represented by capital costs. In this age of modern management, when capital costs can be apportioned to machine hours, square feet of floor space, and cubic feet of plant, there can be no sound argument against failure to treat this item exactly as we do the allocation of wages and material costs to specific work—as part of direct cost of production.

APPORTIONING ADMINISTRATIVE EXPENSES TO SELLING AND MANUFACTURING

In reality, there are no administrative expenses. In the last analysis, such expenses are incurred for making goods or selling them, or both. A chief executive, giving most of his time and thought to manufacturing problems, is as much a factor in manufacturing as the superintendent, and most of his salary should be charged to the operating side. One giving most of his time to the selling side should have his salary charged to the selling side. One dividing his time between the two should have his salary divided between selling and manufacturing, in the approximate proportion to the time he gives to each. The same logic applies to the other items known as administrative. Only by so doing can we have a true picture of selling and

PROFIT ENGINEERING

manufacturing overheads, which is most important in these days of high selling costs.

There is another side to it. The assets side of the books shows the capital employed in the business. Inventory is an asset and is, therefore, capital employed. It takes labor and material and manufacturing overheads, plus part of the administrative overhead, to put goods in the stock room or on the shipping platform. Consequently, inventory should bear the proportion of the administrative expenses which help to make the goods; otherwise we do not get a true capital picture.

We should keep administrative costs as at present, then credit them out by charges to manufacturing and selling overheads. Manufacturing and selling overheads should show as at present, but, in addition, there will be the apportionment of administrative costs.

THE FLAW IN FOLLOWING THE EARTH'S TRAVEL AROUND THE SUN

Why should business blindly follow the earth's travel around the sun in the conduct of its affairs? Is not business a "series-of-years" affair? Does business stop at the end of one travel of the earth around the sun and then start up again at the beginning of the next travel of the earth?

A study of Leonard Ayres charting of business from 1790 indicates that major cyclical swings have averaged 5.34 years each; with the minor swings taking 3.82 years.

In other words, business should view itself from the standpoint of three- to five-year periods.

In this connection, James H. Rand, founder of the Kardex Company, says in his book "Assuring Business Profits" (Forbes):

Five years ago (that was in 1920) in our own business, I called a meeting of our department heads and asked them where they thought they would be in 1925. I asked them to be very definite and specific, not only to estimate the volume of business they thought we should have, but to outline our field of activity and estimate the extent of the organization and the size of the plant necessary to handle it. When

FACTORS GOVERNING PROFIT MAKING

the meeting ended I had a rough picture on the back of a letter. The next morning I turned it over to an architect who drew a rough sketch of the proposed plant. It has hung in my office ever since as a daily reminder and an inspiration.

If you can't draw a definite picture of your business—one year, two years, or five years hence—you had better knock off work tomorrow and spend the day on some very definite planning. Otherwise most of your efforts will be wasted.

After four and a half years of the specified five years had elapsed we were but halfway to the goal. I do not think, even in the face of this fact, that a single man in the organization doubted that we would get there. Six months later, on the day set for reckoning, we took account of stock and found that our plant, though not exactly like the one in the picture, was larger and that the business not only met but exceeded the specifications set down in detail five years before.

One of the most successful concerns the author ever studied maintained a five-year and a sixty-month moving average covering pertinent financial and operating facts. Periodic booms and depressions did not cause undue expansion of plant and business, on the one hand, or undue pessimism and hasty, ill-advised actions, on the other.

While continuing to keep accounting records on a yearly basis as at present, a business should look and plan ahead, while keeping an eye on cyclical averages monthly and yearly covering its vital statistics. If a single month is nothing to go by in the consideration of a year's activity, neither is a single year from the standpoint of the business cycle, and business is basically cyclical in character as the Ayres charting referred to amply proves.

TRUE VIEWS OF WRITING OFF CAPITAL VALUES

In addition to the treatment of depreciation presented in a previous chapter—the case of supervisor and taxicab—and the recommendation that it be considered as a direct cost, in another section of this chapter, it was felt that, because this vital matter is so important in these times, it should be treated at even greater length, from the standpoint of its relation to the value of capital.

In viewing depreciation as an economic matter, the author desires to cite some expert opinions.

The first is a consideration of depreciation as a management problem, by W. Clement Moore, business economist and cost specialist; assistant district manager, Wolf and Company; and vice president, Advisory Management Corporation, Philadelphia, as stated in letter to the author, as follows:

The ultimate and principal purpose in providing for depreciation is to set aside a sufficient sum to cover the replacement cost of the asset against which the reserve for depreciation is provided.

Depreciation, therefore, requires a theoretical and mathematical measurement of the useful life of the asset, because it must represent the loss sustained by years of service, wear, tear, and the ravages of time generally. Thus, the study of depreciation resolves itself also into a study of capital values.

In order that the books of account of any business may properly reflect the true, and definitely earned, income of that business, we must be absolutely sure that all deductions have been charged against the total revenue received. We must be sure that all adjustments be made for losses, breakage, or impairment of capital due directly to the operation of the business. The result will be the net operating income of the business—and we measure the financial success of that business by that result.

Depreciation, representing the loss in value of the fixed assets arising from their use in the business, must be considered in all operating statements.

Depreciation becomes a regular recurring charge against operations, fluctuating only with the acquisition or disposition of depreciable assets. Due to this regularity, depreciation charges are easily allocated for cost purposes, either to specific machines or locations, or for comparative general costs, they may be spread on a monthly or periodical basis.

Of course, there will always be a difference between the theoretical formulae used for computing depreciation, and the actual wear and tear or reduction in utility value of the asset. Due to such difference, an adjustment to the profit and loss or surplus account will always be necessary at the time of the final disposition of the asset.

Consequently, the most accurate rates for depreciation are determined only by history or experience as to the length of the useful life of the asset to be depreciated, in the particular line of business in which it is used or of which it forms a part.

Different accounting and financial demands upon depreciation as a deduction, unfortunately, has brought some strange results during the past few years.

FACTORS GOVERNING PROFIT MAKING

To illustrate, during the rather prosperous years immediately following the World War, when profits were plenty and federal taxes high, every taxpayer was anxious to be fair to the Government, yet they were also interested in obtaining as liberal deductions for depreciation on their tax returns as possible. As a result, these same taxpayers today find themselves with fully equipped plants, operating efficiently, and calculated to continue in efficient operation for several years to come, yet, due to excessive depreciation, the buildings and equipment have been written down to a nominal value, or even written off the books entirely.

Such excessive depreciation charges may create embarrassing situations. Accordingly, it behooves the wise accountant and business executive to be as fair and just as possible in determining depreciation rates.

Instances where excessive depreciation may be unwise may be cited, as, for example, in the case of fire losses, or other losses covered by insurance, wherein it would be difficult to recover from the insurance company more than the net depreciated value. In like manner, if it is desired at any time to sell a building, piece of machinery or equipment, the net book value after depreciation might be much less than the owner would care to admit. Again, excessive depreciation might be embarrassing in submitting an audited statement to a bank or banker for credit purposes.

Books of account should always reflect, as nearly as possible, the true financial condition of the business. Depreciation, therefore, must be properly and conscientiously handled; otherwise the facts regarding the business will be greatly distorted by that one factor alone.

Some authorities use the terms "complete" and "incomplete" as applied to depreciation. These terms are neither descriptive nor accurate. By "complete" depreciation, such authorities mean that there has been credited to the Reserve for Depreciation the full value of the asset. When this condition arises in your reserve, a much better term than "complete" would appear to be "balanced depreciation," because at that point, the total depreciation equals the total value of the asset and the proper accounting procedure is to "balance out" both the Asset and the Depreciation Reserve Accounts by a "charge" to the "Reserve" and a "credit" to the Asset which automatically "balances" both accounts.

In like manner, it would appear that "incomplete" is wholly erroneous as a term. If by "incomplete" such authorities really mean the "Accumulated Reserve," then we might wonder why they do not use such a term. But "incomplete" might mean many other things, for example, "Current or Annual Depreciation," which, of course, really demand accurate terminology and no other terms are quite so clear as "current" or "annual," as applied to the year's charge off for depreciation.

PROFIT ENGINEERING

Finally, in respect to this subject, every accountant should study *Bulletin F* and "Depreciation Studies," issued by the United States Treasury Department, as a guide to reasonable depreciation rates.

The next is in the form of excerpts from an article "What Happens to Income from Depreciation?" by A. A. Hadden, vice president, the Thompson & Lichtner Company, Chicago, published in *Factory and Industrial Management*, as follows:

If a plant is to maintain its equipment in such condition that it can meet any reasonable demand for replacement, funds must be available for the purchase of new equipment whenever it becomes apparent that the advantages of the new equipment will justify its purchase. To be in such a position, the funds provided from depreciation in costs of goods must be carefully and scrupulously segregated and safeguarded. In fact there is a very serious question whether the company which pays dividends without setting aside funds to offset depreciation reserve is not in as reprehensible a position as the promoter who attempts to deceive the ignorant investor by paying large dividends out of the capital received from other investors.

Income from depreciation should be regarded as a trust—to be administered for the good of the plant equipment, to the end that the plant may always be in a position to produce on even or better terms than any of its competitors, and to conserve the original investment of the stockholders.

The ideal situation would be one in which the depreciation fund is exactly equal to the reserve for accrued depreciation, as shown by the balance sheet.

If industrial executives had made a practice in the past of making depreciation something more than a bookkeeping entry—if income from depreciation had not been paid out in dividends, or omitted in order to reduce prices, or lost in the general shuffle—there would be an amount of money available today which, if expended to lower production costs, would be sufficient to change the entire complexion of the present business situation.

OBSOLESCENCE

The treatment of obsolescence in industry is another element to which more and more attention will be given, both as to inventory and as to equipments.

Regarding inventory, the Department of Commerce tells us that it costs at least 10 per cent to carry inventory,

FACTORS GOVERNING PROFIT MAKING

of which 5 per cent is for obsolescence. In these times, particularly with reference to certain industries, a reserve for inventory obsolescence should be set up, in two divisions:

- A. Fixed charge covering a minimum inventory.
- B. Variable charge covering the rise in inventory as volume of sales increases.

It follows also that minimum inventory should be carefully set, as well as the allowances above the minimum. Turnover of inventory should be watched as carefully as cash in bank.

Regarding equipment obsolescence, a quotation from Mr. Moore's letter is here presented, as follows:

Obsolescence is frequently confused with depreciation. It is quite permissible that the two might be merged in some cases, because both depreciation and obsolescence might affect an asset at the same time. They are distinctly different from an accounting standpoint. While depreciation is a theory or theoretical accounting for annual or periodical exhaustion, wear and tear—obsolescence is a very definite and easily measured condition affecting the asset.

We might estimate that an asset will have a useful life for our needs for ten years, and thus fix a 10 per cent rate of depreciation thereon, but after five years of use, we might find that some new invention has just been put on the market which will make that particular asset worthless to us in our business within the next two years. For our own protection then, we should add to our 10 per cent depreciation each year, an additional 15 per cent for obsolescence, in order that our Reserve may be fully "balanced" at the end of the two years and the asset eliminated from our books.

Obsolescence comes about when style, usage, demand, or other conditions render an asset useless or of no further useful value in the business. The purpose of a charge for obsolescence is to take up the undepreciated loss on such asset by the time it must be discarded.

From the accounting standpoint, a separate account may be opened for "Obsolescence Reserve" if desired, or the charge may be made in the same manner as depreciation and a credit carried to the regular "Depreciation Reserve" as "Additional Depreciation due to Obsolescence." Use whichever method appears to better suit your purposes.

FIXED ASSETS DEFLATION

We are in a period when more attention than ever before is being given to the matter of the adjustment of fixed-

asset values, because, as a result of the rise in values during the "Coolidge prosperity" era, and their fall in subsequent depression, we now find it necessary to adjust values to conform to the present purchasing power of the dollar.

In previous chapters we have advocated that assets and liabilities should be separated as between operating and financial assets and liabilities, so as to have the business of manufacture and sale "as an operation" viewed in the right way—the economic way—in the financial books of a company. This was to be done, it will be recalled, by deducting from the total assets, nonoperating plant and real estate, excess funds not needed in the business and invested in marketable securities, and good-will for which there was no exchange in value. Liabilities were to be adjusted accordingly.

It was also stated in this chapter, in section "The Relation of 'Real' Dollars to Fixed-asset Values," that these values should be allowed to rise and fall with the rise and fall in the purchasing power of the dollar.

Whether these things are done or not—although the author feels that they will be universal practices in time—it is clear that it is necessary to have appraisals made of plant and equipment, with values on the books adjusted to conform with those shown by the appraisals.

Regarding this step, C. Oliver Wellington, partner, Scovell, Wellington & Company, Boston, has this to say in an article "Deflating the Plant Accounts," in *The Robert Morris Associates Bulletin*, for July, 1932:

It is important, however, that the appraisal not only show fair values in use but, in connection with an engineering survey of the business, make the proper classification of the total assets between those to be used and those to be discarded or sold. It may be desirable, for example, to classify the plant assets in three groups, such as:

1. Assets which definitely will be used.
2. Assets which are unused but may well be held for future developments.
3. Assets which are unused and may be sold or discarded.

In considering the probable use of plant assets, the engineering study should take into consideration not only the facts available in regard to

FACTORS GOVERNING PROFIT MAKING

the particular company, but also those with reference to the industry and possibly related industries, in order to determine a reasonably accurate picture as to what may be expected in the near future, say, for example, the next five years.

After the fair values of the plant assets have been determined on a current basis in the proper classifications, the books should be adjusted to reflect the appraisals. In most cases the charge corresponding to the credit to the plant accounts should be to capital surplus or capital-stock value. The exact way in which the adjustment should be made will depend upon the legal requirements, upon the existence of any surplus other than earned surplus, and upon the amount of the latter in relation to the adjustment of plant values. In general, such a plant adjustment as we are suggesting should affect earned surplus, if at all, only to a small extent, for if we assume depreciation charges in years prior to 1932 have been adequate under conditions as they then appeared, the operating costs and financial statements have included adequate charge for depreciation, and the earnings as stated have been true earnings. What we now face in effect is a reduction of capital somewhat similar to the reductions in capital that individuals as well as corporations have suffered, and it is hardly logical to charge this reduction against earned surplus. It certainly is not logical to leave the company with a deficit, when what is desired is to bring the plant accounts down to the level of current values, thus giving the management an opportunity to make an operating showing on the new basis, with no unfair load from the past, but with only a fair charge for the property which it uses.

THIRTEEN-PERIOD CALENDAR

To standardize and make uniform all comparative data, which will be a real aid in profit planning and control, the thirteen-period calendar is advocated. More and more concerns are adopting this basis, and it is felt that it is only a matter of time when business generally will operate on the basis of thirteen months to the year.

A typical month—every month of every year—of the Cotsworth Calendar, which is the one generally recommended, is as follows:

Sun.	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

PROFIT ENGINEERING

A year would consist of thirteen such months, with one blank day at the end of the year, Dec. 29, which would be known as "year day." To make the thirteen months, a new month called "Sol" would be placed between June and July.

These advantages are given by Kingsley Gray, in "Why Change the Calendar," in the Jan. 15 issue of *Forbes*:

1. The fact that every month would be like every other month would cause every date in the month to have a fixed place in the week. For example, the seventh of the month would always be a Saturday, the ninth always a Monday.

2. The complete four weeks would exactly quarter all months, harmonizing weekly wages and expenses with monthly rent, accounts, etc. There would be no fractions of weeks at month ends.

3. Every month would have the same number of working days.

4. Pay days would recur on the same monthly date.

5. Holidays and other fixed month dates would always occur on the same week-day.

6. The reckoning of lapse of time for interest and other purposes would be greatly simplified.

7. As there would be thirteen monthly settlements during the year, instead of twelve, there would be a faster turnover in money; the same volume of business could be handled for less money.

8. There would be a saving in printed calendars, and of time in referring to them. They would be superfluous.

9. The climax of this series of reasons, and the one most generally mentioned by business men who have replied to the various questionnaires is that this calendar would make comparative statistics absolutely reliable. And comparative statistics are the compass and chart of modern business. February could be accurately compared with January, three days short as it now is. A retail store, for example, would no longer have to make adjustments for the five Saturdays of one month as compared with the four of another.

ECONOMIC RESEARCH

Economic research will become an important factor in the profit making of tomorrow. Today, there are splendid economic services, bank letters, government reports, magazines containing trade information, society and convention bulletins and reports, and a host of other things, all of which have a bearing on industrial and financial

trends and tendencies. But what is the situation usually found in most concerns? The different executives receive the various services, letters, magazines, and the like, take a "hop-skip-and-a-jump" through them, then they find their way to the files, and become buried beyond hope of resurrection. A definite policy should be mapped out regarding what to get and for whom, and after they are looked over they should be returned to the department looking after economic research, for a systematic analysis, abstracting, and charting process, which will make this section of the work, a "court of last resort" for worth-while opinions as to fundamental economics. And the resultant money savings will be surprising.

CHAPTER XV

MATHEMATICS BEHIND THE PROFITGRAPH

By ARTHUR J. MINOR, B.S., C.E., *Business Consultant*

Mathematicians sometimes speak contemptuously of philosophy; and philosophers sometimes speak contemptuously of mathematics. The contempt thus manifested does not spring from mathematics in the former case, nor from philosophy in the latter; in both cases it springs out of ignorance—philosophical ignorance of mathematicians and mathematical ignorance of philosophers. No doubt philosophically unenlightened mathematicians and mathematically unenlightened philosophers will quarrel in the future as in the past; but in the future as in the past, the quarreling and sneering will be the quarreling and sneering of men and not of the great subjects they represent and misrepresent; for between the spirit of mathematics and the spirit of philosophy there is no discord, no antagonism, no strife; they are by their natures friendly rivals in the pursuit of truth and light; they are companions in excellence; they are comrades in the service of wisdom.—CASSIUS J. KEYSER, Ph.D., LL.D., in “Mathematical Philosophy” (Dutton).

As a result of several years of study and practice of the technique of profit planning and control, based on the principle of variable budgeting, as formulated by Mr. Knoepfel (of which the Profitgraph is the keystone), the writer of this chapter has developed a body of mathematical formulas underlying this technique.

He feels that this fundamental development covering the mathematics behind the Profitgraph (and all that is involved in its preparation and use), can serve two purposes:

1. Reinforce all that the author of this book has claimed for this new approach to profit assurance.
2. Aid those struggling with profit problems more readily to use this new and better approach to the task of planning for profits, and then working the plan.

It will be agreed by all that both general and cost accounting rely almost entirely on the simpler phases of mathematics: addition, subtraction, multiplication, and division. General and cost accounting have failed to recognize that algebra, geometry, trigonometry, and the calculus are but condensed arithmetical methods which provide a most useful means for simplifying involved calculations usually relied upon in business practice.

The Profitgraph coordinates the various factors of sales, costs, and profits. The mathematical formulas presented herein directly aid in this coordination. In this, the writer of this chapter has endeavored to keep his work within the understanding of those possessing a fair knowledge of algebra and analytical geometry. To the extent possible, the formulas will be expressed in words, so that those familiar with arithmetic only will be able to understand the calculations.

These calculations will be expressed as theorems, followed by the mathematical expression of the formula, followed in turn by a word statement of the formula.

EXPLANATORY NOTES

To avoid confusion in chart designations, illustrations in this chapter will be called charts instead of figures, and letters instead of numerals will be used.

Whenever "other income" and "other outgo" are referred to in this chapter, the *excess* the one over the other is meant. Thus, "other income" will mean that the financial income is greater than the financial outgo. It means a net figure—a plus or minus total.

The word "operating" as used herein means the results of the business before financial adjustments (other income and outgo) and interest on borrowed capital. The word "business" means the results after financial adjustments but before interest on borrowed capital. The one means the business as an operation covering manufacture and sale; the other the business as a whole (with interest considered as a profit deduction).

PROFIT ENGINEERING

KEY TO SYMBOLS

- S = net sales income
 P = profit
 F = fixed outgo
 V = variable outgo
 X_{op} = operating profitless point
 F_{op} = operating fixed outgo
 F_o = fixed other income or outgo (excess, plus or minus)
 V_{op} = variable operating outgo
 V_o = variable other income or outgo (excess, plus or minus)
 X_b = business profitless point
 Nl = normal capacity
 $X_{op}Nl$ = normal-capacity profitless point
 n = means the word "any"
 Sn = sales at any value
 Pn = profit at any value
 P_b = business profit
 Vn = variable outgo at any value
 I = interest on borrowed capital
 X = rate of income tax
 D_p = preferred dividends
 D_c = common dividends
 S_r = surplus retention
 P_s = surplus profit
 NW = net worth

FUNDAMENTAL EQUATION

We begin by applying the principles of analytical geometry and its backbone, the coordinate axes. In this connection, see Chart A.

For the equation of a straight line:

a. Intercepting the y axis at 0 plus:

$$y = mx + b$$

$$m = \text{slope} = \tan \alpha$$

$$b = \text{intercept } y \text{ axis}$$

$$\text{when } x = 0, y = b$$

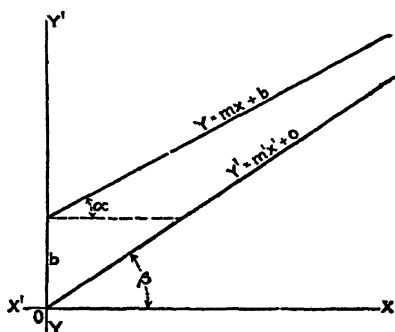


CHART A.

b. Intercepting the y axis at 0 as shown in Chart A:

$$y' = m'x' + 0, \text{ or } y' = x'$$

$$m' = \text{slope} = \tan \beta = \tan 45^\circ = 1.0$$

$$\text{when } x' = 0, y' = 0$$

From the above:

$$y = x$$

$$y = mx + b$$

and by substituting the value of x for y in the equation $y = mx + b$ and solving for x , we have:

$$x = mx + b$$

$$x - mx = b$$

$$x(1 - m) = b$$

$$x = \frac{b}{(1 - m)} \quad (1)$$

The following values are assigned to their equals in the fundamental equation, (1):

$$\tan \beta = \tan 45^\circ = 1.0$$

S = total net sales income = y

P = total profit

V = total variable outgo

F = total fixed outgo = b

$$\tan \alpha = \left(\frac{V}{S} \right) = m$$

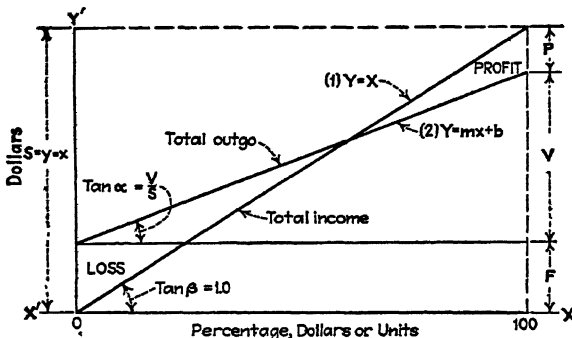


CHART B.

In Chart B, the y, y' axis is given a plus value of S or 100 per cent total net sales income. Since $\tan \beta = \tan 45^\circ$, the

PROFIT ENGINEERING

x , x' axis has the same value. The y and x axes are also given the value of outgo. The total net sales income y varies between 0 and 100 per cent capacity. The total net sales income (S) equals the fixed outgo (F), plus the variable outgo (V), plus profit (P) as loss or gain.

PROFITLESS POINT CALCULATIONS

Theorem Ia. To determine operating profitless point in dollars, when total net sales income, total fixed outgo, and total variable outgo, all at 100 per cent capacity, are known.

$$X_{op} = \frac{F}{\left(1 - \frac{V}{S}\right)} \quad (2)$$

Operat-
ing
profit-
less
point (in
dollars)

$$= \frac{\text{total fixed outgo (in dollars)}}{\left(\text{one (unity)} - \frac{\text{total variable outgo (in dollars)}}{\text{total net sales income (in dollars)}}\right)}$$

Ib. When there is an excess of other income, then F and V become

$$F = F_{op} - F_o$$

$$V = V_{op} - V_o$$

in solving for X_b in dollars.

Ic. When the excess is of other outgo, the F_o and V_o values become plus values.

Theorem IIa. To determine percentage of capacity operating profitless point (expressed as a decimal), when total fixed outgo, and total profit, all at 100 per cent capacity, are known.

Dividing both sides of Eq. (2) by S , then

$$\frac{X_{op}}{S} = \frac{F}{S - \frac{SV}{S}} = \frac{F}{S - V} = \frac{F}{F + P} = X_{op} \% \quad (3)$$

$$S - V = F + P$$

MATHEMATICS

$$\begin{array}{l} \text{Percentage} \\ \text{capacity} \\ \text{profitless} \\ \text{point (as a} \\ \text{decimal)} \end{array} = \frac{\text{total fixed outgo} \\ \text{(in dollars)}}{\text{total profit} \\ \text{(in dollars)} + \text{total fixed} \\ \text{outgo (in} \\ \text{dollars)}}$$

IIb and IIc. To solve for X_b %, see Theorem *Ib* and *Ic*.

Theorem III. To determine percentage of operating profitless point in terms of normal capacity (as a decimal) as base (100), when normal capacity is expressed as a percentage of 100 per cent capacity, and F and P values are 100 per cent capacity values.

Divide both sides of Eq. (3) by Nl :

$$\frac{X_{op} \%}{Nl} = \frac{F}{Nl(F + P)} = X_{op} Nl \% \quad (4)$$

$$\begin{array}{l} \text{Percentage nor-} \\ \text{mal capacity} \\ \text{operating profit-} \\ \text{less point (nor-} \\ \text{mal capacity as a} \\ \text{base)} \end{array} = \frac{\text{total fixed outgo (in dollars)}}{\text{percentage} \\ \text{normal} \\ \text{capacity} \\ \text{(as a decimal)}} \times \left(\begin{array}{l} \text{total} \\ \text{fixed} \\ \text{outgo (in} \\ \text{dollars)} \end{array} + \begin{array}{l} \text{total} \\ \text{profit (in} \\ \text{dollars)} \end{array} \right)$$

Theorem IV. To determine percentage operating profitless point in terms of 100 per cent capacity, when normal capacity (as a decimal) is a percentage of 100 per cent capacity, and F and P values are taken as normal capacity values.

Multiply both sides of Eq. (3) by Nl :

$$(X_{op} \%) Nl = \left(\frac{F}{F + P} \right) Nl = X_{op} \% \quad (5)$$

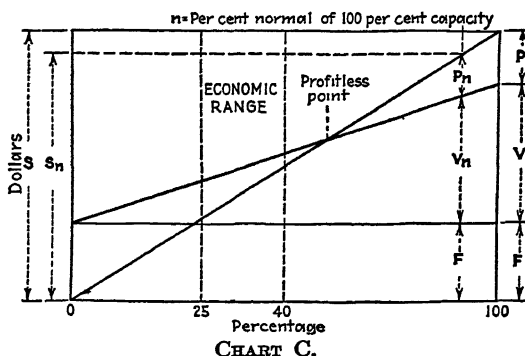
$$\begin{array}{l} \text{Percentage oper-} \\ \text{ating profit-} \\ \text{less point (in} \\ \text{terms of 100} \\ \text{per cent capacity)} \end{array} = \left(\frac{\text{total fixed outgo (in} \\ \text{dollars)}}{\text{total fixed} \\ \text{outgo (in} \\ \text{dollars)}} + \frac{\text{profit (in} \\ \text{dollars)}}{\text{at normal} \\ \text{capacity}} \right) \times \begin{array}{l} \text{normal} \\ \text{capacity} \\ \text{percentage} \\ \text{(as a} \\ \text{decimal)} \end{array}$$

SALES AND PROFIT CALCULATIONS

In developing the equations for "any" value (see Chart C), the following is basic:

PROFIT ENGINEERING

$$S_n = P_n + V_n + F \quad (6)$$



Theorem Va. To determine minimum net sales necessary to meet operating profitless point in dollars.

$$V_n = \left(\frac{V_n}{S_n} \right) S_n, \text{ with } P_n = 0$$

Substituting these values in Eq. (6),

$$S_n = \left(\frac{V_n}{S_n} \right) S_n + F$$

then,

$$S_n \left(1 - \frac{V_n}{S_n} \right) = F$$

By transposing and factoring,

$$S_n = \frac{F}{\left(1 - \frac{V_n}{S_n} \right)} \quad (7)$$

$$\text{Minimum net sales to meet operating profitless point} = \frac{\text{total fixed outgo (in dollars)}}{\left(\text{one (unity)} - \frac{\text{total variable outgo (in dollars)}}{\text{total net sales (in dollars)}} \right)}$$

Vb and Vc. To reconcile for "business" (b) results instead of "operating" (op) results, see Theorem Ib and Ic.

Theorem VIa. To determine operating profit in dollars at any net sales dollars.

P_n = profit in dollars at S_n (any net sales income)

$$P_n = S_n - (V_n + F) \quad (8)$$

$$= S_n - \left(\frac{V_n}{S_n} S_n + F \right)$$

$$= S_n \left(1 - \frac{V_n}{S_n} \right) - F \quad (9)$$

Profit (in dollars) at any net sales = $\frac{\text{total net sales income}}{\text{income}} \times$

$$\left(\text{one (unity)} - \frac{\text{total variable outgo (in dollars)}}{\text{total net sales income}} \right) - \frac{\text{total fixed outgo (in dollars)}}{\text{income}}$$

VIb and VIc. See Theorem Vb and Vc.

Theorem VIIa. To determine per cent of operating profit (as a decimal) at any total of net sales income.

$P_n\%$ = percentage of profit at S_n (any net sales income)

Dividing both sides of Eq. (9) by S_n ,

$$\frac{P_n}{S_n} = P_n\% = \frac{S_n}{S_n} - \left(\frac{V_n}{S_n} \right) \left(\frac{S_n}{S_n} \right) - \frac{F}{S_n} = 1 - \left(\frac{V_n}{S_n} \right) - \frac{F}{S_n} \quad (10)$$

$$\begin{aligned} \text{Percentage profit (as a decimal) at any net sales income} &= \left(\text{one (unity)} - \frac{\text{any variable outgo (in dollars)}}{\text{any net sales income}} \right) - \\ &\quad \left(\frac{\text{total fixed outgo (in dollars)}}{\text{any net sales income}} \right) \end{aligned}$$

VIIb and VIIc. See Theorem Vb and Vc.

PROFIT ENGINEERING

FIXED-OUTGO AND PROFITLESS-POINT RANGE CALCULATIONS

Each class of industry has a range within which the profitless point should fall. A particular business in a class would have its own profitless-point range. This range is governed by the vitality of the operations, profit task imposed, capital employed (net assets), "net worth content" as Mr. Knoeppel calls it, long-term economic cycles, seasonal variations, all with reference to the normal operating capacity. Knowledge of normal operating capacity, profitless-point range, and the profit task readily provides a means for determining the justification for the existence of a business and measures the competency of a management.

With reference to Profitgraph in Chart C and in the frontispiece, it will be observed that the profitless-point range is from 25 to 40 per cent of full practical sales capacity. Previous chapters have dealt with the matter of the profit task, the equation for which will be given later.

We shall now proceed with calculations dealing with this matter of allowable fixed-outgo and profitless-point range.

Theorem VIIIa. To determine maximum fixed outgo that will insure operating profitless point falling at a required percentage of capacity, when required operating profit only is known.

Using Eq. (3), and solving for total fixed outgo (F),

$$\frac{F}{F + P} = X_{op} \%$$

Then let

P_n = total operating profit required

F = fixed outgo allowable to insure operating profitless point falling within required range

$X_{op} \%$ = required operating profitless point in percentage of full practical capacity

$$\begin{aligned} F &= X_{op} \% (F + P) \\ &= (X_{op} \%)F + (X_{op} \%)P_n \\ &= F - (X_{op} \%)F = (X_{op} \%)P_n \end{aligned}$$

$$F(1 - X_{op} \%) = (X_{op} \%)Pn$$

$$F = \frac{(X_{op} \%)Pn}{(1 - X_{op} \%)} \quad (11)$$

$$\text{Maximum fixed outgo in dollars} = \frac{\text{percentage operating profitless point required} \times \text{operating profit required}}{\text{one (unity) - percentage operating profitless point required}}$$

VIIIb and VIIIc. See Theorem Ib and Ic.

For formula to determine required business profit, see Theorem XX.

Theorem IXa. To determine necessary operating profit required to insure operating profitless point's falling at a required per cent of capacity, when irreducible fixed outgo is known.

Again using Eq. (3), and solving for profit (Pn),

$$Pn = \frac{F(1 - X_{op} \%)}{X_{op} \%} \quad (12)$$

Necessary profit =

$$\frac{\text{irreducible fixed outgo} \times \left(\text{one (unity) - required percentage of operating profitless point} \right)}{\text{required percentage of operating profitless point}}$$

IXb and IXc. See Theorem Ib and Ic.

Theorem Xa. To determine the allowable fixed outgo in dollars, when operating-profit requirement, variable outgo, and net sales income are known.

From Eq. (9),

$$Pn = Sn \left(1 - \frac{Vn}{Sn} \right) - F$$

By transposition,

$$F = Sn \left(1 - \frac{Vn}{Sn} \right) - Pn \quad (13)$$

$$\text{Allowable fixed outgo (in dollars)} = \frac{\text{net sales income}}{\text{net sales income}} \times \left(\text{one (unity)} - \frac{\text{variable outgo}}{\text{net sales income}} \right) - \text{profit requirement}$$

X_b and X_c . See Theorem I_b and I_c .

Theorem XIa. To determine necessary total net sales income for an irreducible fixed outgo and profit required, all in dollars.

From Eq. (9),

$$P_n = S_n \left(1 - \frac{V_n}{S_n} \right) - F$$

Solving for S_n ,

$$S_n = \frac{P_n + F}{\left(1 - \frac{V_n}{S_n} \right)} \quad (14)$$

$$\frac{\text{Total net sales income}}{\text{income}} = \frac{\text{required profits} + \text{irreducible fixed outgo}}{\left(\text{one (unity)} - \frac{\text{variable outgo}}{\text{net sales income}} \right)}$$

XI_b and XI_c . See Theorem I_b and I_c .

Theorem XIIa. To determine allowable maximum fixed outgo in dollars, and establish operating profitless point at a per cent of the attainable net sales income.

From Eq. (13),

$$F = S_n \left(1 - \frac{V_n}{S_n} \right) - P_n$$

At profitless point $P_n = 0$

Solving for F , after giving proper value to $X_{op}\%$,

$$F = S_n (X_{op} \%) \left(1 - \frac{V_n}{S_n} \right) \quad (15)$$

$$\text{Allowable maximum fixed outgo} = \left(\frac{\text{net sales income}}{\text{profitless point required}} \times \left(\text{one (unity)} - \frac{\text{variable outgo}}{\text{net sales income}} \right) \right)$$

XIIb and XIIc. See Theorem *Ib* and *Ic*.

Theorem XIIIa. To determine total allowable variable outgo for given net sales income, when operating profit required and fixed outgo are known.

From Eq. (9),

$$P_n = S_n \left(1 - \frac{V_n}{S_n} \right) - F$$

And

$$\left(1 - \frac{V_n}{S_n} \right) = \frac{P_n + F}{S_n}$$

Then

$$1 - \left(\frac{P_n + F}{S_n} \right) = \frac{V_n}{S_n} = \text{percentage of net sales income to be allowed as variable outgo}$$

So

$$V_n = S_n \left[1 - \left(\frac{P_n + F}{S_n} \right) \right]$$

$$\text{Total allowable variable outgo} = \frac{\text{net sales income}}{\text{profitless point required}} \times \left(\text{one (unity)} - \frac{\text{fixed outgo}}{\text{net sales income}} \right)$$

XIIIb and XIIIc. See Theorem *Ib* and *Ic*.

DETERMINING CROSSOVER POINTS OTHER THAN PROFITLESS POINT

Originally the author of this book placed the fixed-outgo area at the bottom of his Profitgraph, as shown in Chart C in this chapter. Beginning with 1930, he placed the variable-outgo area at the bottom, on which he superimposed the fixed-outgo area, as shown in Chart D in this chapter. This latter method was found to be more scientifically correct and economically sound, as previous chapters indicate. The

PROFIT ENGINEERING

calculations previously given, however, apply with equal facility to both methods of preparing a Profitgraph.

As the Profitgraph in frontispiece indicates, there are other crossover points than the profitless point, as, for instance, the one after interest on borrowed money (Crisis Point); the one after interest, income taxes, and preferred dividends (Danger Point); and the one after interest, income tax, preferred and common dividends (Unhealthy

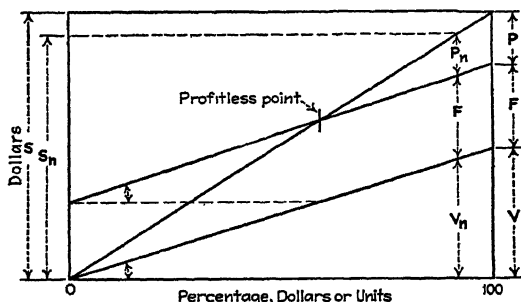


CHART D.

Point). Another one is known as "Surplus Retention Point" where, after taking care of interest, taxes, and dividends, there is a fair profit retention for the business to add to the surplus account.

In determining these crossover points, they will be considered from the standpoint of operating results only, as if there was no excess other income or excess other outgo. The procedure will then be given for the excess, the one over the other, of other income or other outgo, as in Theorem *Ib* and *Ic*. It should be stated that, in most cases, the excess will be that of other income, due to removing interest on borrowed money from financial adjustments, and considering it as a part of "business profit."

Theorem XIVa. To determine net sales necessary to meet the Crisis Point (the point below which interest on borrowings is not earned).

Substituting *I* (interest) for *P_n* in Eq. (14),

$$S_n = \frac{I + F}{\left(1 - \frac{V_n}{S_n}\right)}$$

$$\text{Net sales income} = \frac{\text{interest} + \text{operating fixed outgo}}{\left(\text{one (unity)} - \frac{\text{variable outgo}}{\text{net sales income}} \right)}$$

XIVb. To determine total income necessary, as "business income" necessary to meet the designated crossover point, when there is an excess of other income, then F and V become

$$\begin{aligned} F &= F_{op} - F_o \\ V &= V_{op} - V_o \end{aligned}$$

XIVc. When the excess is of other outgo, the F_o and V_o values become *plus* values.

Theorem XVa. To determine the net sales necessary to meet the Danger Point (the point below which preferred dividends are not earned).

Substituting I and D_p (preferred dividends) and X as the percentage (as a decimal) income tax rate, for P_n in Eq. (14),

$$S_n = \frac{I + F + \left(\frac{D_p}{1 - X} \right)}{\left(1 - \frac{V_n}{S_n} \right)}$$

Net sales
income =

$$\frac{\text{interest} + \text{operating fixed outgo} + \left(\frac{\text{preferred dividends}}{\text{one (unity)} - \left\{ \begin{smallmatrix} \text{per cent income tax} \\ \text{rate (as a decimal)} \end{smallmatrix} \right\}} \right)}{\left(\text{one (unity)} - \frac{\text{variable outgo}}{\text{net sales income}} \right)}$$

XVb and *XVc.* For excess other income and excess other outgo, use F and V values as shown in Theorems *XIVb* and *XIVc*.

Theorem XVIa. To determine the net sales necessary to meet the Unhealthy Point (the point below which common dividends are not earned).

Substituting I , D_p , D_c (common dividends), and X , for P_n in Eq. (14),

PROFIT ENGINEERING

$$S_n = \frac{I + F + \left(\frac{D_p + D_c}{1 - X} \right)}{\left(1 - \frac{Vn}{S_n} \right)}$$

$$\text{Net sales income} = \frac{\text{interest} + \text{operating fixed outgo} + \left(\frac{\text{preferred dividends} + \text{common dividends}}{\text{one (unity) - per cent income tax rate (as a decimal)}} \right)}{\left(\text{one (unity) - } \frac{\text{variable outgo}}{\text{net sales income}} \right)}$$

XVIIb and *XVIIc*. For excess other income and excess other outgo, use F and V values as shown in Theorems *XIVb* and *XIVc*.

Theorem XVIIa. To determine the net sales necessary to meet the Surplus Retention Point (the point where a predetermined rate of surplus profit is left for addition to surplus account).

Substituting for P_n in Eq. (14),

I for interest

D_p for preferred dividends

D_c for common dividends

S_r for surplus retention (as a decimal)

X per cent rate of income tax (as a decimal)

Then

$$S_n = \frac{I + F + \left(\frac{D_p + D_c}{(1 - X)(1 - S_r)} \right)}{\left(1 - \frac{Vn}{S_n} \right)}$$

Net sales income =

$$\text{interest} + \text{operating fixed outgo} + \left\{ \frac{\text{preferred dividends} + \text{common dividends}}{\left(\text{one (unity) - income tax rate in per cent (as a decimal)} \right) \times \left(\text{one (unity) - rate surplus retention in per cent (as a decimal)} \right)} \right\}$$

$$\left(\text{one (unity) - } \frac{\text{variable outgo}}{\text{net sales income}} \right)$$

XVIIb and *XVIIc*. For excess other income and excess other outgo, use F and V values as shown in Theorems *XIVb* and *XIVc*.

Theorem XVIIIa. To determine the net sales to meet the required per cent of surplus profit (P_s per cent) on the net worth (NW).

Substituting as before and adding the new values,

$$S_n = \frac{I + F + \left(\frac{NW \times P_s \%}{(1 - X)} \right)}{\left(1 - \frac{V_n}{S_n} \right)}$$

$$\text{Net sales income} = \frac{\text{interest} + \text{operating fixed outgo} + \left(\frac{\text{net worth} \times \text{per cent surplus profit (as a decimal)}}{\text{one (unity) - income tax rate in per cent (as a decimal)}} \right)}{\left(\text{one (unity) - } \frac{\text{variable outgo}}{\text{net sales income}} \right)}$$

XVIIIb and XVIIIc. For excess other income and excess other outgo, use F and V values as shown in Theorems XIVb and XIVc.

Theorem XIX. To calculate for net sales at deadline (where surplus profit equals going interest rate on net worth), substitute this going rate for P_s per cent in the above theorem and solve for S_n , then proceed as shown in XVIIIb or XVIIIc.

Theorem XX. To determine the business profit (P_b) in dollars necessary to meet financial obligations.

Business profit = operating profit plus excess other income or minus excess other outgo (both fixed and variable).

V_o should be added to or subtracted from V_n , as previously explained.

F_o should be added to or subtracted from F .

$$P_b = I + \left(\frac{D_p + D_e}{(1 - S_r)(1 - X)} \right)$$

$$\text{Business profit (in dollars)} = \text{interest} + \left\{ \frac{\text{preferred dividends} + \text{common dividends}}{\left(\text{One (unity) - surplus retention in per cent (as a decimal)} \right) \times \left(\text{one (unity) - income tax rate in per cent (as a decimal)} \right)} \right\}$$

NOTE.—Substituting business profit P_b in Eq. (14) for P_n , the required net sales task in dollars may be calculated (see Theorem XI).

PROFIT ENGINEERING

STRAIGHT LINES VERSUS CURVES

So far we have considered the application of the Profit-graph principles to conditions which permit of sales and costs being represented by straight lines from 0 to 100 per cent capacity. These lines, mathematically speaking, are not straight lines. Nor are they smooth curves. Their nature depends in each case upon the nature of the costs and the fixed and variable elements in other income and other outgo. Curved lines can be drawn to represent sales and costs, but the resulting mathematical calculations would involve the solution of exponential equations, which are usually too complex for ordinary use.

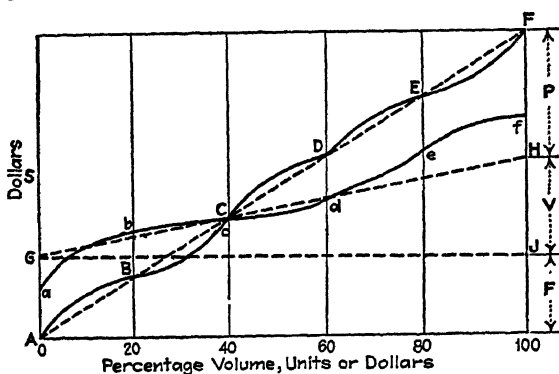


CHART E.

Wherever possible, straight lines should be used to simplify both the charting and the mathematical calculations. This can be done by drawing median lines between a series of high and low points up the capacity scale. When straight lines become too inaccurate (with curved lines too complex), chords of arcs can be used to advantage.

In Chart E, conditions of sales and other income are represented by the irregular curve *A-B-C-D-E-F*. Costs are represented by the irregular curve *a-b-c-d-e-f*. Chords may be drawn between critical breaks in these curves, as *A-B*, *B-C*, *C-D*, *D-E*, *E-F*; and *a-b*, *b-c*, *c-d*, *d-e*, *e-f*. Any number of chords may be drawn, depending upon the refinements desired.

Values within the range of each chord can then be calculated. As an example, take the range from 40 to 60 per cent on Chart E. Chords have been drawn, $C-D$ and $c-d$, to o ordinate and to 100 per cent ordinate. When the necessary factors are inserted in the formulas previously developed, solutions are possible for all desired values in the range from 40 to 60 per cent capacity. In like manner, values in ranges o to 20 per cent, 20 to 40 per cent, 60 to 80 per cent, and 80 to 100 per cent can be ascertained.

MANAGEMENT INCENTIVES

Chart F is presented as a graphical exposition of Mr. Knoeppel's principle of management incentives as discussed in a previous chapter. The chart will be found to be self-explanatory.

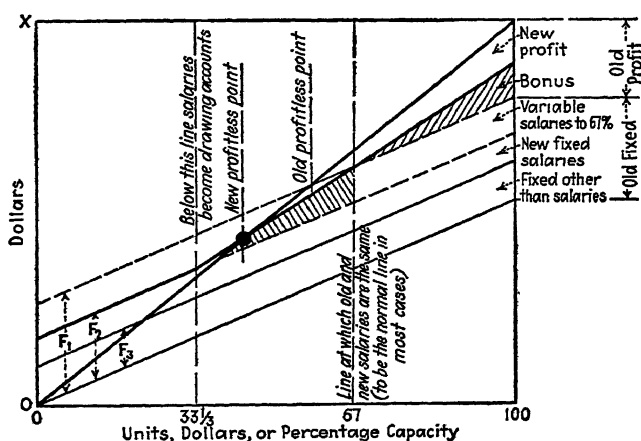


CHART F.

To amplify his presentation in mathematical terms, the author of this chapter calls attention to the fact that $(F_1 - F_3)$ establishes the previous fixed salaries at normal capacity. Fixed salaries adjusted on the incentive basis are $(F_2 - F_3)$. Above $33\frac{1}{3}$ per cent capacity, the variability in salaries becomes $(F_1 - F_2)$.

The allowable total salary expense at any activity, both fixed and variable, can be found by using this formula:

$$E_s = (F_2 - F_3) + V(x - y)$$

PROFIT ENGINEERING

in which $(F_2 - F_3)$ is a minimum, and

x = current unit activity in per cent

y = unit activity at $33\frac{1}{3}$ per cent capacity

V = variability per unit of activity

E_s = allowable total salary expense at any activity

STANDARD COSTS AT NORMAL CAPACITY

The business world is more and more coming to the viewpoint that standard costs and pricing on the basis of normal capacity are elements of such extreme value as to force their consideration in any plans for intelligent profit control. This is particularly true in light of the splendid contributions of G. Charter Harrison's "Standard Costs" (Ronald Press) and W. L. Churchill's "Pricing for Profit" (Macmillan). These men have been pioneers in these fields.

To clarify the calculation of the over- or underabsorbed fixed burden, further mathematical treatment of the Profit-graph technique of variable budgeting is necessary.

Space limitations do not permit of any extended treatment of this subject in this chapter, but two simple charts with accompanying formulas will more fittingly take the place of pages of writing. In Chart G is the standard cost presentation in terms of *total* costs; in Chart H, in terms of *unit* costs. Under each chart is the statement of values and formulas.

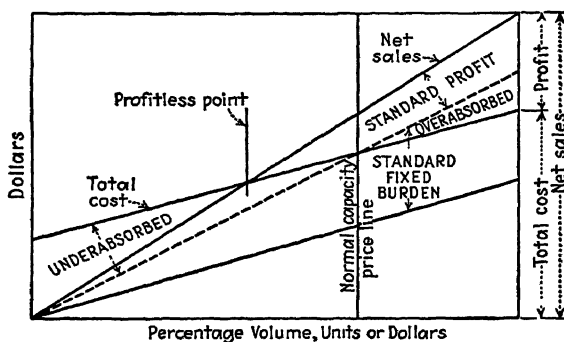


CHART G.

St = total standard cost at normal capacity

Vt = total variable costs at normal capacity

MATHEMATICS

Ft = total fixed costs

Nl = percentage normal operating capacity (as a decimal)

$$St = Vt + Ft$$

Pt = total standard profit at normal capacity

Ts = total standard net sales at normal capacity

$$Ts = Pt + Vt + Ft$$

Na = actual percentage of activity for current period
(as a decimal)

BO = total overabsorbed burden (percentage of activity
is above normal)

$$BO = Ft \left(\frac{Na}{Nl} - 1 \right)$$

BU = total underabsorbed burden (percentage of ac-
tivity is below normal)

$$BU = Ft \left(1 - \frac{Na}{Nl} \right)$$

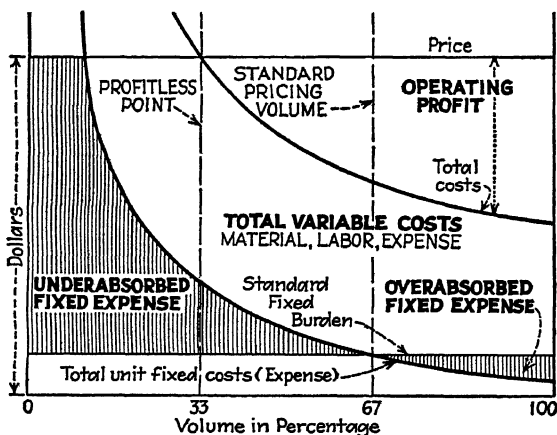


CHART H.

Su = standard unit cost at normal capacity

Vu = total variable unit costs

Fu = total fixed unit costs at 100 per cent capacity

Nl = percentage normal operating capacity (as a decimal)

$$Su = Vu + \left(\frac{Fu}{Nl} \right)$$

Pu = standard unit profit

Up = standard unit price

$$Up = Pu + Vu + \left(\frac{Fu}{Nl} \right)$$

Na = actual percentage of activity for current period
(as a decimal)

Bo = overabsorbed

$$Bo = \left(\frac{Fu}{Nl} \right) - \left(\frac{Fu}{Na} \right)$$

Bu = underabsorbed

$$Bu = \left(\frac{Fu}{Na} \right) - \left(\frac{Fu}{Nl} \right)$$

CONCLUSION

The author of this chapter has endeavored to set forth the most pertinent elements in the mathematics behind the technique of the Knoeppel Profitgraph. He realizes that, in the narrow limits of a single chapter in a book, the best he could do was to demonstrate (1) that there is a fundamental mathematical background, and (2) that the accountant and engineer have so much in common in the vital work of profit planning and control as to justify the use of the phrase "profit engineering."

Furthermore, he feels that this step is but the beginning in the development of a mathematical technique in business procedure, and that this chapter will form a link in the chain.

CHAPTER XVI

SECURING SALES CALLED FOR BY PROFITGRAPH

By E. ST. ELMO LEWIS, Sales Counsel

If we can get the orders, we can easily manufacture the product, but first we must get the orders.—JOHN H. PATTERSON, former president, National Cash Register Company.

Everybody who has ever been connected with a business organization realizes that the most critical element in business is sales. It is well enough to arrange production programs and factory schedules, but unless the sales department can bring in the requisite volume of orders, the best laid plans are totally upset. . . . It is the forecast of sales that determines not only production and personnel policies but the financial management of the enterprise.—ROGER W. BABSON.

Find out what people *want*—convince them that your product—or services—will satisfy that want, and your prospect buys.—JAMES A. WORSHAM.

Obviously, in considering Mr. Knoeppel's "*needed* sales to net a *required* profit," the question at once arises, "Very good, we have found what we must make in the way of a profit—we have found what sales we must make on the basis of our present skill—but how are we going to get the sales?"

We shall answer that now and amplify as we proceed.

First, by finding out what a profitable price for our product really is. Second, by finding out if we really have a market for the product at that price.

Third, by determining what is the best way to sell it.

Fourth, have we the money and men to do the job? If not, what changes in product are necessary? What changes in policy? And can we make the changes? Shall we go ahead on the basis of the reasonable expectations disclosed?

PROFIT ENGINEERING

This we shall do by objective analysis of the market—which is called market research. We find that profit does not depend on what *we* need, but on what we can collect by a profitable price from our market, *i.e.*, customers and prospects. Our problems are now not only ones of analysis, but of performance, *i.e.*, handling of our opportunities in the market, and handling of our sales man power. Just as in the application of scientific management to production, where it was soon found that it was not only the problems of finding the right thing to do and the right way to do it that had to be solved, but it was the equally important problem of stimulating the management and workers to do the right thing in the right way *all* the time. That was the more difficult.

PRODUCTION MUST FIT CONSUMPTION

Let us start with an axiom: finance, production, and sales must fit consumption. It is a thankless and profitless task to sell an article that nobody wants or needs. We may try to sell electric refrigerators to people who do not want them at the time, but, if we know they *need* them, we shall persist as long as our capital and conviction hold out. But, before we start to make or to stock, we are going to appraise the strength of that need on the part of the public that we must overcome. That is a precaution of mere common sense.

The job of management is to know that public in relation to its product—what does the public want, consciously and unconsciously? Therefore we know that the consumer is the final arbiter of the life and success of our business. The consumer pays the wages, salaries, profits—keeps us in business or puts us out—decides our fate. No matter how clever our production systems, adequate our cost and accounting methods, elaborate our selling plans, beautiful our advertising, technically perfect our product, if the consumer does not want what we make in sufficient volume at a profitable price, it is only a matter of time when we shall

SECURING SALES

have to fold up and pass out of the picture. All of which is perfectly obvious to the most superficial thinker.

It seems equally obvious that it is but common sense to go out into the market and find what the conditions are, as a matter of careful fact finding. There are few who do so, however.

Who goes out into the field and makes a careful and impartial audit of the consumer attitude toward a new product, a new policy, a new advertising campaign, before the article is produced, the sales policy put into force, or the advertising campaign started? In forty years of this work, the writer asserts that less than 10 per cent of business concerns, but 90 *per cent of those who do so succeed*. Let us put it another way—the vast majority of continuously successful concerns predicate their moves on market data such as this.

Aside from the consumer attitude, there is another thing we must know—what is the real attitude of the human links in the chain of distribution toward our company, our article, our prices, our policies? To what degree can we count on them for necessary cooperation—and what kind of cooperation is that?

Many changes have taken place in the old distribution set-up. In many lines, modern selling has reversed the old process—the manufacturer selling what he liked to make to the wholesaler, the latter to the retailer who hoped he could sell it to the consumer, the last often refusing to buy. Today, owing to the chain and department store merchandising's being much more sensitive to the costs of consumer education, the retailer asks, "Who will buy it?" "How do you know?"

The consumer makes his demands on the retailer, who demands saleable articles from the wholesaler, who passes the demand on to the manufacturer. The wholesaler used to sell *to* the retailer *for* the manufacturer. The direct-to-the-retailer methods of the manufacturer have forced the wholesaler to reverse his process, *i.e.*, to become more concerned about the retail outlet to the consumer; hence,

the wholesaler has become purchasing agent for the retailer, rather than selling agent for the manufacturer. This reversal is significant in many ways.

Market research thus discloses the importance of the consumer acceptance to the manufacturer, wholesaler, and retailer. Market-research methods cover a large field. They vary all the way from making door-to-door canvasses by paid interviewers in selected districts in selected cities, towns, or sections of the country, to sending out letters asking one or more simple questions of a picked list of people whose opinion or reactions you think will give you the facts you need. Some questionnaires are quite impressive affairs. One asked 136 questions in 30 pages; another, handled by interviewers, asked 69 questions; one used by Macy in New York asked 94 questions and covered 11 pages. But the significant fact is that intelligent merchandisers are not guessing as to their market. It is not enough to have statistics of consumption, buying power, and price lines in general terms. These are but the background of the more intensive particularization of trends and tendencies.

For instance, William H. Lough gives some highly interesting figures proving his contention that the total part of the consumer's dollar paid out for distribution costs has not grown during the past few years (contrary to general opinion). But what the furniture manufacturer wants to know is, "Where does my cost of sales stand in relation to other furniture manufacturers, and must I spend more to market my production?"

The modern producers are going out and getting answers to questions at first hand from their customers, prospects, and cooperators. They are not depending on what they "think" the consumer should buy. They are finding out what the condition of the consumer mind really is—what the sticking points may be.

The facts about the market are not easy to correlate with any plant's problem of finances, equipment, and man power. More important than getting the facts—what of the interpreter of the facts? Who is going to say what the facts mean?

Who is going to say what should be done in the light of the interpretation? What is the right thing to be done?

Fundamental, is it not? Too fundamental—for many American business men do not like fundamentals. They want stunts, ideas, plans, schemes, clever ways to “put it over.” It has been too easy to buy these stunts, ideas, plans, schemes, forgetting that we were buying them to sell our products; but we forgot the selling of our products in the brilliancy of the stunt. We forgot the fundamental—will it *sell* our products? Will it pay us a *profit*?

There is another fundamental constantly ignored—do the people want our product? Do we need another factory to make it?

Too many fatuously say, “We’ll make ’em want it! How can you tell what people will buy until you try them? ‘Do we need another factory?’ What’s that got to do with it? There are a lot of people making and selling automobiles; why not get some of that money? We can make ’em as good as those on the market.”

Most people go into a business because some other person has made, or is supposed to be making, money in the business. They really know very little about it. That is what we call liberty! All too often liberty to waste money, time, work, materials, energy, thought, hope, faith, in making things people do not want at all, or in ways they do not want them, or at prices they will not pay for them: building factories that are not needed. It is so easy to find out before all those things are wasted!

As Charles F. Kettering (vice president, General Motors Corporation, in charge of research) once said of the causes of the 1930 depression: “Studying the human need, supplying the thing to fill it—here’s the basic fundamental set-up, and I don’t care how big you are, or how skillful, the minute you get away from this basic situation you run into trouble.”

If men would stop thinking of stocks and bonds in terms of dollars and think of them in terms of refrigerators that had to be sold to make the bonds worth dollars and cents;

f they would stop thinking of plants in terms of brick, concrete, and acres of ground, and of equipment in terms of speed and gadgets and production, and think of the people who must buy the product at a profit, in order to make the plant and equipment worth while; if men would think of the whole job of business in terms of the consumer, they would save millions of wasted money. It is not alone the manipulation of materials, money, and men in making things, no matter how wonderfully perfect, but it is equally the manipulation of that public outside; its thoughts, understanding, and friendliness, which, too, enter into the great game of making a profit. That is a different job, an entirely different job!

There are many managers suffering today because they have not recognized the importance of the consumer—the truly “forgotten man” in the industrial picture. Let us revert to some fundamentals affecting our attitude toward this consumer.

A business is financed, a factory is built and equipped, an organization is developed, all for the purpose of making and selling something at a profit. Therefore, the creation or development of an efficient selling process is at least 50 per cent of the problem; it may be, as in the case of undistinguished commodities, 90 per cent of the problem. The profitable sale of a product is the ultimate purpose of any business. If it fails, then the business fails. The real cost of production is not alone the cost of physically producing the article, *but it is the cost of producing the satisfied customer.* The vital importance of the selling process is apparent. It receives a lot of attention in business, but all too little analytical consideration. A comparison of what is spent on scientific, technical, and engineering research with what is spent on scientific market research, or on the development of better sales, advertising, and merchandising technique, will demonstrate how backward is the appreciation of the importance of the whole problem of distribution at this time, when this problem is the master problem before the world.

SECURING SALES

THE EIGHT SALES FALLACIES

At the heart of this failure lie certain fallacies. It is extremely difficult for the physicist to realize that markets are basically psychological as well as physiological. A market is a complex of money and minds. Robots can sell, but robots do not buy. A market, in other words, is composed of human people called the public. That public doesn't have to buy our goods, pay our price, or even consider our proposition. That public is a complex of busy, fickle, indifferent, exacting, cruel, sentimental people, who are full of prejudices, hates, greeds, and whims, with ignorance and vanity in good measure—and yet, in parts, friendly and easily influenced, *if you know how*.

We suffer from certain fallacies in our conceptions of the public, in relation to business, for these fallacies color our judgments and expectations, therefore our plans, often with disastrous results.

1. It is a fallacy that the public will automatically select the best. Fashion proves this. The basement stores prove it. Every retail store will demonstrate it. Intrinsic value or quality must be sold.

2. It is a fallacy that the public knows the difference between price and value. The stock markets of 1929 and 1932 are examples. The present merchandise market demonstrates it.

3. It is a fallacy that the public will automatically reward enterprise and service of either men, institutions, or products. The public must be told and sold constantly, and with a full understanding of the public's disinclination to support claims of superiority.

4. It is a fallacy that the public knows what it wants. It knows better what it does *not* want. The public is not creative. Commercially, the public has little consistency or constancy of demand. Its sense of value is so individualistic that it has little permanency.

5. It is a fallacy that the public will demand over any great length of time what it is not constantly reminded of. The insurance tables are the evidence. Men die forgetting what you sell. Other men are born who may never know.

6. It is a fallacy that value can be anything but a personal estimate of desirability on the part of the buyer. The buyer is the measure of all things commercial—his attitude and acceptance or rejection determine the value.

PROFIT ENGINEERING

7. It is a fallacy that the public will surrender its freedom of choice to any committee of experts or technicians to determine what it should buy, or to fix what are necessities and what are luxuries, without the most careful propaganda. Remember the preparation for the war; and look at prohibition. The home-economics and fashion advisers on the staffs of household publications will tell you that the majority of inquiries want you to tell them that they are right in doing what they want. It is one of the "inalienable rights" of Americans to be wrong when they feel like it. That is the human factor which so often upsets the technical analysis.

8. It is a fallacy that "purchasing power" alone is the measure of a market. If people will not spend (as in 1932), the fact that they can spend is of but academic interest, unless proper psychological means are taken to change their minds.

MAKING THE MARKET SURVEY

In the brief space of this chapter we can do little more than scan the surface of the activities of a modern sales department. We know this:

1. We can pretest our markets for the acceptability of any product.
2. We can test for price reactions.
3. We can estimate more accurately the probable demand and thus fix the sales task more equitably.
4. We can select better sales material and personnel.
5. We can train salesmen to be more effective.
6. We can maintain sales efficiency by more scientific incentives and rewards.
7. We can pretest our advertising.
8. We can pretest our sales and merchandising plans.
9. We can make market studies that will give us warning in time to shift our production schedules and sales plans and prevent maximum wastes.

And, finally, we know that, no matter how we accomplish it, we must have the results of these things, or we waste money in high sales costs; or we see all our carefully prepared profit-control effort lost in the mad waste of the scramble for sales.

A careful survey and objective audit of the market of every concern should be made periodically or, in the case of large concerns, *continuously*. Even small retailers in country towns can afford it.

SECURING SALES

Take the following questions. Few executives have the data to answer them, yet not one of the answers is useless. Every question goes to the problem of profits.

1. *Is the product saleable?*

Is it acceptable to the prospect in design and scope of usefulness?

Is the price in line with the prospect's habit of purchase?

Is it equal or better in quality and adaptability competitively?

Is the dealer price in line?

Is our sales organization realizing on its possibilities?

Do we know what each salesman should sell in his territory?

Is our advertising effective in turning the mind of the potential market in our direction?

Are we getting the best effort out of each salesman?

2. *What may we do to increase the effectiveness of our sales dollar?*

Have we fully explored the possibilities of applying the variable-budget technique to coordinate production, sales effort, and profit requirements to our problem?

What percentage of increase of sales can the present plant handle?

Projected on the present growth, what is the trend of the market and our sales?

What changes will this require in plant, warehousing, branches, sales organization, advertising, and financing?

What research work in product, plant improvement, and market should we do?

What provision should we make for outside or independent research and audit of our plans and the data on which they are based?

What changes in the merchandising plan may be necessary in the next five years?

What competitors and competitive products will need special study and attention, and what provision should be made for this work to be carried on by independent investigators and interpreters? Even when we have an approximately accurate size-up of our markets, we do not check the handling of the opportunity.

3. *Has the product a profitable market acceptance?*

What is the normal market?

What percentage do you have?

How much has been sold?

What profit?

PROFIT ENGINEERING

What price and profit changes have occurred during the past five years?

What changes have occurred in the volume of demand, over five- and ten-year periods?

Has the sales cost been going up per unit?

At what volume did sales costs begin to rise?

What merchandising plans have been used during the past five years?

Estimate success of each—give reasons for success and failure.

Is the present merchandising plan sound?

Do you have cooperation of distributors?

Are retailers sold on it?

THE LAW OF DEPENDENT SEQUENCE IN SALES PERFORMANCE TO SALES OPPORTUNITY

We want to be sure that we realize on our sales opportunities. That is the one thing we do not do. We do not know what our real opportunities are. We overlook them, ignore them, or misjudge them. We do not handle them efficiently in our advertising, in our sales promotion, and in our face-to-face selling; we fail to cultivate them intelligently. We wonder why we get so meager a result from so great an opportunity.

Let us take a single instance: the extraction of the greatest possible results from 200 sales prospects. There are 200 prospects in this territory, but our Mailing List Department is not very effective, so it lists 120, where it ought to have the 200, so we start with a listing efficiency of 60 per cent. These 120 names are turned over to the Sales Department. The Sales Department calls on but 72 of the 120 in the time given; the Sales Department is but 60 per cent efficient—they should have called on the full 120 but only got around to 72. That gives an end efficiency of 36 per cent, or it is 60 per cent of the previous 60 per cent. With these 72 names we should interview 72, but we got interviews with only 36. So we are only 50 per cent efficient in the interviewing; thus by this time we are down to an end efficiency of 18 per cent. We want demonstrations, which are a necessary preliminary to getting an order, and again our sales department fails us, getting only 50 per cent, or

SECURING SALES

18 demonstrations out of the interviews. Our end efficiency has dwindled to 9 per cent of the 200 opportunities we started with. We make 18 demonstrations and close $33\frac{1}{3}$ per cent of them, or 6; and we now have an end efficiency of about 3 per cent of our 200 opportunities. We analyze that performance and find that at each step we should have disciplined our performance. By stepping up each percentage of performance we could have done a much better job; if we had made more calls, got more interviews, made more demonstrations, we could have made more sales. But few Sales Departments make such analysis. They will have to do so.

To better such figures is the Sales Department's task. To do it means setting up of performance standards all along that sequence of handling.

THE SALES DEPARTMENT'S TASK

After a reasonable sales expectancy is set up, it is the task of the Sales Department to deliver the result. This is done through the sales quota. It breaks up this yearly volume of sales into months and into territorial expectancies. The quota of the Sales Department is determined by fixing a figure between what the company needs in the way of volume, at a price, and the estimate of what the market will absorb at a certain sales cost.

THE SALES QUOTA

The sales quota is the salesman's task. Anybody on the production side will know what we mean by "task." Quota has the same relationship to the salesman's job as the task has to the workingman in the factory. The quota is "the ratio of reasonable performance to known opportunity." It is our sales expectancy based on what we know is the real opportunity for sales in a given territory in a given time.

Most concerns have a quota, or a volume of sales which it hopes to make. Few of them approach the task of setting a quota of sales with any appreciation of the serious part it plays in the control of profits. The scientific quota system

PROFIT ENGINEERING

an attempt scientifically to see what the company can reasonably expect from each territory—all conditions, economic, social, and business trends, consumer attitudes, competition and internal company efficiency considered.

It was back in 1887 that John H. Patterson started to make forecasts based on the estimates of sales managers. His forecasts were worthless. He then turned to a study of the market possibilities. In 1900 he put into effect the famous sales-quota system in its first crude and arbitrary form, much as it is done today by many concerns who have not studied its real significance and know little of its technique. That sales-quota system has been constantly refined since. It is the basic method of a highly efficient sales control. It has been in use for thirty-two years. The Burroughs system has been in existence since 1909.

BURROUGHS QUOTA SYSTEM

Burroughs Adding Machine Company probably has done more pioneering work with respect to the scientific setting of sales quotas than any other organization. Burroughs developed its quota studies as a result of the background of its early executives who had been associated with John H. Patterson of the National Cash Register Company, where the scientific sales-quota idea got its start.

Burroughs starts its quota studies with two things: (1) a careful analysis of all its past sales in any territory; (2) an analysis of all business enterprises in that territory.

The following, by a Burroughs writer ("Metropolitan Life Studies"), briefly describes the general method that Burroughs uses:

The quota of the company is resolved into points, each \$25 sales constituting a point. Thus, a sale of equipment amounting to \$200 is equivalent to eight points. A total number of points is established at the beginning of the year as the company quota.

The business record of preceding years is used as a 50 per cent factor in establishing sales quotas. This is represented by the number of machines already in use in the territory regardless of date sold.

One-half of the quota is made up on the basis of previous machines in use, for it is felt that, where the company's products have already been

SECURING SALES

sold, there is an opportunity for additional sales. Suppose that the total number of points in use for the entire country is 5,000,000 points, and one-half of the total quota for the year is 1,000,000 points. An agency, therefore, is expected to sell one point for each five points in use. To repeat, the total number of machine points in use is divided by the company's quota. This gives a valuation factor. For each number of machines in use, it is expected to sell one machine having an equivalent sales value.

One-half of the total quota is distributed among the agents at a *pro rata* basis according to the point value of the machines already in use. The other half of the quota is distributed among the agencies on the basis of the number of business enterprises in each agency district.

It is not sufficient to estimate the quota on the basis of the machines already in use. If a bank with deposits exceeding \$5,000,000 is using the company's products, it is reasonable to expect that other banks with equal deposits can likewise advantageously use the company's machines.

The first step taken in distributing the quota among business enterprises was to prepare a new count of such enterprises in the United States and Canada. This count showed a total of approximately 2,500,000 enterprises, classified into ninety-seven divisions. Each subdivision is divided into four groups, according to the size of the concern. For example, in the case of banks, the size is determined by the size of the deposits. A grouping of banks follows:

BANK GROUP

- Group 1. Banks with deposits exceeding \$5,000,000
- Group 2. Banks with deposits of . \$1,000,000 to \$5,000,000
- Group 3. Banks with deposits of . . . 400,000 to \$5,000,000
- Group 4. Banks with deposits up to \$400,000

In the case of commercial concerns the commercial rating is used in classifying such enterprises. For example:

COMMERCIAL GROUP

- Group 1. Includes concerns with rating of \$35,000 or more
- Group 2. Includes concerns with rating of \$5,000 to \$35,000
- Group 3. Includes concerns with rating under \$5,000
- Group 4. Includes concerns not rated

The second step in distributing the quota on the basis of the enterprise count was to determine how much of the business should be secured from the major business classifications enumerated below:

Banks	Public service	Retailers
Financial	Manufacturers	General
Government	Wholesalers	

PROFIT ENGINEERING

The figures shown in the next table, which are purely fictitious and illustrative, give an idea of how such total business might be distributed for the last five years in the United States among the several products of the company:

	Percentage
Banks and financial.....	28
Government.....	1
Public service.....	3
Manufacturers, wholesalers, retailers, and general	68
	<hr/> 100

A further analysis of past performance was made to determine how much business is secured from banks and commercial concerns in the various groups for each of the eight major classifications. These percentages are used in distributing one-half of the company's total quota.

Based on past experience, it became possible to establish a valuation for each business enterprise in the various classes apportioned among the various kinds of machines manufactured by the company.

The sales quota for the salesman should not be set at the highest attainable volume, nor at the lowest. It should be a mean between the average and the best performance.

There are many yardsticks in every business by which to measure possibilities—the important thing is to find them. Where competition is a factor, and a wide choice is given the possible customer, then other factors than those used in the Burroughs case would have to be added.

THE DEVELOPMENT OF SALES-ORGANIZATION EFFICIENCY

There is space for little more than a summary of the personal and technical factors that enter into attaining all the sales a market can produce.

That the head of the Sales Department must be a leader of men is trite and obvious, but today he must be trained technically in the elements of management that never have been considered of any great importance to him. The sales manager is no longer a salesman only. As a matter of fact, he may not be more than an average performer in the field. Today he must understand his function in the profit machine of which he is one of the most important parts. As the controller and executives must understand the prob-

SECURING SALES

lem of sales in those characteristic elements which make sales different from production and finance, so must the sales manager understand their problems. He must explore fully that darkest Africa of sales costs. He must, with all this, have a rich emotional and sympathetic understanding of the temperamental human beings whom he handles. The modern sales manager of really adequate equipment is a rare individuality. The demand for such men is increasing. The supply will never be adequate.

The sales task has been set. The controller and the sales manager have come to an understanding. The yearly volume has been allocated to territories with due consideration for seasonal variations. Each day the sales manager and the controller will watch the barometric charts for the rise and fall of performances.

Aside from the day-to-day prodding here and praising there, pushing here and "riding" there, back of the work in the field there is a mechanism functioning.

SELECTING OF SALESMEN

New salesmen are being fed into the organization. Here, too, hunch and guess are taking a back seat in favor of tests and joint selection by two or more men. New men are trained before going into the field; old ones are periodically brought back to be refinished. Sales courses are growing more simple. They are pedagogically sounder. They are in the hands of better equipped teachers. Salesmen seek training courses today. Some still object—generally the old salesmen, who have never studied them. The company, knowing what the salesmen have to face, having reduced its successful practice, or the practice of its successful salesmen, to an orderly series of progressive steps in sales knowledge, is in a position to speak with authority about how to sell the product, and to require the most efficient salesmen to take its course.

The training of a member of the sales force is enriched by the study of the marketing material used as a basis for the task setting. The salesman himself becomes sold, not only

PROFIT ENGINEERING

on the company and the product but on his own chances for making good. This effect on the vital matter of his morale, of the whole factual approach to the sales problem, is of inestimable value to the company.

THE SALES MANUAL

Every concern, no matter how small, should have a sales manual. It should tell why you are in business; why your products and your methods are superior to competition; justify your prices, your terms, and your sales policies; and why prospects should buy your products. The sales manual should measure up to this specification:

1. It should contain the best answers to all objections.
2. It should contain the best demonstration of your product.
3. It should describe Production and Financial Departments, what they do, and why, in reference to sales and should give the personnel of the executive organization.
4. It should describe the sales, advertising, sales-promotion, research, and service divisions in detail; personnel duties and methods of cooperation with men in the field.
5. It should describe the Improvements Department, personnel, duties, and the like, as well as its value to men in the field.
6. The sales manual briefs the methods by which the product is sold. If sold through retailers of different kinds, it gives the advantages of the product of each line.
7. It should contain authoritative facts, figures, and other proof of value in closing sales.
8. It must be fact-founded from cover to cover. There must be no bluff or bunk in a sales manual.
9. It should be illustrated with photographs to show reality, give eye-proof of claims; it should illustrate by cartoons; it should demonstrate by charts.
10. It should be loose leaf, and in a constant state of revision as better things are found.

Every man in sales and office, and executives in finance and production, should know the sales manual. It takes time. It is never finished. It requires competency.

THE SALES DECISION BOOK

There should be a Sales Decision Book, *i.e.*, a small vest-pocket book which the salesman carries with him all

SECURING SALES

the time, as he does his price list. In this decision book he is told what kinds of business he can take, under what terms, prices, arrangements, deliveries; what kind of advertising is done; what reports he must make out daily, weekly, and monthly; what he can and cannot charge to the expense account; what allowances he can make; how he is to handle credits, exchanges, competitive goods, and a code for use in telegrams; a price list; when he will get his pay check and expense advance; what kind of hotels he is to stop at; how he is to route himself; who has charge of departments at home office and what they are expected to do for him, and how he can secure their cooperation; the division of commissions, the credit of points and sales, and many other things. Some of these books have as many as 205 decisions. They constitute the laws of the company.

The sales decision book eliminates uncertainty. It stops a lot of favoritism. It cuts out a lot of executive vacillation and instability. It standardizes the interpretation of policies. It cuts correspondence, telephone calls, and telegrams. Every man can get an exception to a decision for a sufficient reason. The book reflects policies and interprets them in terms of the daily work in the field.

The sales decision book is the salesman's assurance that the company has the same policies—that all men are being treated alike. It makes it possible for heads of departments to synchronize their decisions. It makes it possible for subordinates to make decisions without burdening executives with anything but exceptions. It makes it possible for the man in the field to make his decisions on the spot, and not infrequently the fact that the company has made the decision in print can be shown the prospect and thus end an argument or overcome an objection.

Again we see the fact-guided mind at work in the decision book. It coordinates effort—and keeps the salesman selling prospects and not trying to sell the company on some unacceptable variation.

PROFIT ENGINEERING

SALES CONTESTS

Most sales managers believe in sales contests. The salesman, his wife, his home, his family—you hire them all when you engage a salesman. You have to get them all working. What they think of dad's boss and dad's firm, and what they are urging dad to do about getting another job, all have a bearing on what dad does. The National Cash Register Company uses prize books, illustrating hundreds of merchandise prizes from pencils to suites of furniture—something for every member of the family. Sherwin-Williams, Burroughs, General Electric, Addressograph, and many others have used them.

Dad takes the book home and says, "We're in a contest." What happens? It gets the wife and children into the contest. Mother says, "Well, I would like to have that nice, overstuffed leather chair for the library." Dad says, "All right, let's see, we've got to get 1,480 points for that."

Then what happens? Why that sales manager has an assistant sales manager in that salesman's home. Every night when that salesman comes home, he is checked up on how much closer that chair is to the family living room. The wife works on the job. She's not overlooking a bet. That's using the home and the mother. The National Cash Register once brought the wives to a general convention—left all the men home—and told the wives how they could help or hinder their salesman husbands in the job they had. It helped a lot. Here again is the scientific attitude at work—getting all the sales power concentrated on the sales objective.

There are conventions of all-star men, *i.e.*, those who have sold 125 per cent of quota every month for a year. There are sales bulletins to let men know where they stand in relation to quota and to each other. Drive? Yes, but a great game, and the men like it.

THE POINT SYSTEM OF SALES CONTROL

The salesman's prime job is to make sales. In a more primitive day, all we expected of him was sales. He took a

bunch of samples, some expense money, and "went on the road." He wrote us letters, sent in orders, and didn't know what salesmanship was, didn't care, and believed in the divine law that made some men salesmen and others book-keepers. Today the development of a high selling cost, and the demands of the consumer, the fight of competition, the day-by-day pressure for results, from top down, has changed the whole game of selling. Every word, every move, every hour, every penny, every thought must count.

Many new demands are made on the salesman's time. He must make sales, but he must make records and reports and do many other things that are but indirectly connected with sales. The salesman is restive under the new demands. He resents many things. He feels that only his sales records count for him, but he is asked to do a lot of things aside from making sales. If he fails to do them, the failure counts against him; if he does them, they do not count *for* him. This is unfair and unsound.

Out of this condition came the Point System of Sales Control. Fundamentally it is sound, as a device on which to build a system of appraisal of the value of the salesman's use of his time and, as such, a sound basis for his compensation. It requires considerable study for proper application, but well worth all its costs.

In the first place, it takes time; in the second place, it takes thinking; and, in the third place, it requires supervision. It takes a lot of careful statistical study. That precludes any possibility of wide acceptance. The purpose of the point system is to evaluate the different activities of the salesman in terms of points. A point is not money. It is like a "trick" in a game of cards. It is an arbitrary unit of measurement. We can publish the showing in points in our sales bulletins, but no salesman is able to tell that John Jones, for instance, did so many dollars in actual sales. In this particular case we use a point per dollar; *i.e.*, for every dollar of sales basically, there was one point credit given. Additional points of bonus credit may be given for sales made in certain lines, the sale of which is impor-

tant for any reason. Where the full price has been received, *i.e.*, catalogue or list price, a bonus of 5 to 15 per cent in points was credited for the sale, depending entirely upon how keen competition is. Where we are selling a popular product, of easy acceptance, we give one point per dollar flat. A new product, not yet accepted, two points per dollar. You can vary these credits in any way that you please, which is an advantage; a high-profit product, where we wanted to push a sale, two points per dollar; products being closed out, two and a half to five points per dollar of sales. Cut prices—now get this—cut-price penalty in points of one-half to all the variation in the points in the cut; in other words, if there is a cut of twenty points in the price, we would take all of that away and another twenty points on the general point credit to the salesman. In other words, if he sold it for 100 and it should have been sold for 120, there was a cut of twenty, we took twenty off and gave him credit for but 80.

Customers affect points of credit: one point per dollar sale, plus 20 per cent in bonus points for the *new customer on the first sale*. Sometimes that runs for the first month of the selling where the unit order is small. On orders received by mail (with no call in thirty days) one-half point credit per dollar. That is to put a premium on the salesman making calls, and not depending on the mail-order business, which is a serious item in some territories and in some lines. No penalty for mail orders from hard-to-reach territories.

Loss of customer, i.e., no order within three to nine months or a year, penalty of 10 to 20 per cent of previous six months' business with that customer, depending on the desirability of customer.

Penalty for *bad debt through failure to report*, a percentage of points represented in the debt, minus.

Data report turned in within twenty-four hours of call—not next month, but within twenty-four hours of call—and after that, a penalty. One-quarter point of credit given for each daily report.

SECURING SALES

Daily report on advertising, one-quarter point in addition to the regular report.

Mailing list of dealer, two to five points; *installation of window trim*, two to five, or even twenty, points credit; *demonstrations to prospect without sale*, two points; *misrepresenting facts in reports*, 10 to 15 per cent penalty.

For business exceeding 80 per cent of quota for one month, 1 per cent of total points as bonus; for 100 per cent of month's quota, 2 to 10 per cent of points bonus; for reducing expense of traveling, percentage of savings in points.

There may be many other important evaluations in any business. The point system is so flexible that it makes the task of application to any conditions a very easy matter.

ADVERTISING

The advertising of a product is affected by the merchandising studies. Tremendous changes have taken place in advertising since market research came to be a requirement of modern sales practice. One of the most important changes has been in the demand for pretesting of advertising ideas, plans, campaigns. "Copy" is much more sales minded, and less stunty and merely clever. The sales manager wants sales-making, sales-helping copy. He demands that the sales money spent shall do a job, and that it can be proved that it is doing it; hence there is now provision made for using marketing data and the quota figures for guiding the advertising performance. The advertising objective thus synchronizes with the sales objective as to time, place, and intensity. This coordination helps.

Good, *i.e.*, effective advertising doesn't happen. It can be tested; it can be uniformly effective; and it can be made of definite value to the whole sales campaign and to the individual salesman. Its effectiveness can be measured relatively, and its contribution proved.

CONCLUSION

This method of approaching the sales problem of the organization, apart from the system of tying the perform-

ance into the general records of the company, deals with the consumer as the important sales factor, determines the job to be done in terms of company profit requirements plus the sales opportunity, estimates the kind and quantity of man power necessary to do it, sets up the methods for developing the man power in terms of the consumer, places such incentives and rewards before the man power as will insure its working at its most successful pitch, determines the task of the sales organization, individually and collectively, in terms of a quantitative and qualitative task.

To paraphrase something that Harrington Emerson once said about efficiency: Success is the moral, physical, and mental ability which finds and takes the best, easiest, and quickest way to the most desirable things of life. That, too, is the secret of sales efficiency, or success in the pursuit of that desirable thing of business—*a profit*.

CHAPTER XVII

ORGANIZING A BUSINESS FOR PROFIT MAKING

The system of operating, merchandising, marketing, and financial control outlined in my recent book, "The New Way To Net Profits," is merely a plan on paper until an intelligent and efficient chief executive with an educated and trained organization of men in key positions make it vital, thus accomplishing a co-ordination of thought and effort which is the desired result.—FRED W. SHIBLEY, in Foreword to booklet "What Your Men Mean to You."

The reasons for so much of what is called "unorganization" in American industry are as follows:

1. The general tendency to build organization around personnel, without reference to plan and design.
2. The woeful lack of knowledge of what constitutes plan and design in industrial organization.
3. Failure to consider that no attainment is more efficient than the organization which makes it possible.
4. Troubles and weaknesses at the bottom are usually reflections of troubles and weaknesses at the top.
5. Failure to consider some of the major functions that have been found necessary in the industrial business.

In the last analysis, everything that we do or say or make or use is the product of the human mind. The human is the power behind everything. Organization, therefore, is the proper relationship between humans in their efforts to accomplish certain definite things in life—as, for instance, profits in a business. If this adjustment is faulty, then we have an inefficient organization, incapable of making a success of what it undertakes, whereas if it is correct, logical, and developed along sound lines, then success is bound to be the result.

Despite the great importance of this matter of industrial organization, it has been observed that relatively few concerns give it more than incidental consideration. In only

a few instances does it occupy a major place in the deliberations of management, from the standpoint of type design of organization, personnel relationships and most fitting round pegs into round holes, organization charts, manuals, organization policies, and the like. The majority of the organizations which have been studied in the course of a busy professional life have been found to be hit-and-miss affairs.

Study the organization of any ten firms selected at random, and you will likely find ten different organizational structures. If the best practice as to organization in one could be built into the others—modified of course, to fit the local conditions—it is obvious that all would profit enormously.

Basically, an organization is the human machine built to accomplish certain definite results and, like any machine, should have its design and specifications.

ORGANIZATION MODELS

In any consideration of this matter of industrial organization, the first question which confronts us is, What model can we pattern after?

Man himself is a marvel of organization. There is a mass of evidence to indicate that the human being possesses the elements necessary to consider when trying to improve business organization. Unfortunately, while we live in our bodies all our lives, we are only generally informed regarding how we operate as organized entities.

Let us, therefore, examine man as an organization (Fig. 38). First in order of importance is the central directing agency—the cerebrum—as the chief executive of the body (management), where thought, judgment, reason, coordination, and volition are centered. This chief executive has major assistants:

1. The cerebellum, which is in charge of the voluntary organs of the trunk, arms and hands, legs and feet, mouth as a talking mechanism and the generative organs; so that *performance* may be properly guided. This is the division of *action*.

2. The medulla oblongata, which is in charge of the work of the involuntary organs—heart, lungs, stomach, liver, bladder, kidneys, intestines, and the like; so that *service* may properly be rendered. This is the division of *facilitation*.

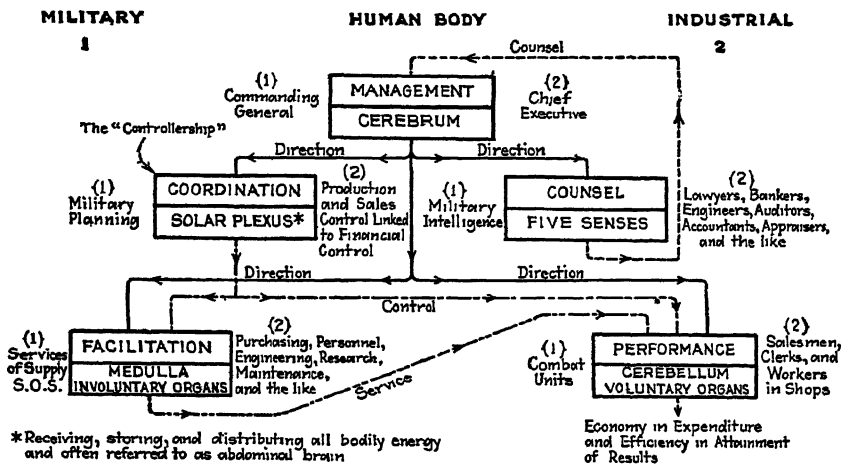


FIG. 38.—The model organization.

Next, there is that great cluster of nerves focusing in the solar plexus, referred to as the "abdominal brain," which receives, stores, and distributes all bodily energy, particularly to the "action" and "facilitation" divisions. This is the division of *coordination*, or the bodily "controller." So vital is this function in the affairs of the body that the cerebrum can be removed and the body will still partially function. Remove the solar plexus, however, and the body will soon cease to exist. In this function lies bodily *control*.

Last but not least is the great division of *counsel*, consisting of the cranial nerves and sense terminals, commonly known as the "five senses." This is the analytical, the informative and formulative function. Here is where you find the experts, the specialists. They are absolutely indispensable in the human body, as the brain does not in itself achieve or counsel itself or sustain itself. It takes the analysis, the information, the formulation and then considers, decides, and issues *directing* instructions, to the end that there may be a maximum of results with a minimum of expenditure of energy.

PROFIT ENGINEERING

In other words, the human body is organized around these five major divisions of direction, counsel, coordination or control, facilitation or service, and performance or action. All through the human body is a logical grouping of smaller functions into larger ones; then the larger ones into the five mentioned; and finally these five into the body as a whole, the aim of which is fourfold in nature:

1. Conversion of mental and physical energy into some form of useful work.
2. Provision for self-expression and creativeness.
3. Perpetuation of itself through reproduction.
4. Economy in expenditure of energy and efficiency as to results.

Incidentally, this fourfold aim holds for industry, as reflection will indicate.

Peculiarly enough, whether by accident or design, successful organizations of man's creating—whether in war or business—have been modeled after the human body organization. This is particularly true of military warfare, about which more will be mentioned in this chapter. Observe for instance, these parallels:

Body organization and function	Military organization	Business organization
Cerebrum—direction...	Commanding general	Chief executive
Five senses—counsel.....	Military intelligence	Lawyers, bankers, auditors, accountants, appraisers, engineers, and the like
Solar plexus—coordination.....	Military planning	Production and sales control linked to financial control
Involuntary organs—facilitation	"Services of supply"	Purchasing, personnel, engineering, research, maintenance, and the like
Voluntary organs—performance.	Combat units in the field	Salesmen, workers, and clerks, and their supervisors

ORGANIZING A BUSINESS

THE NECESSITY FOR COORDINATION AND COUNSEL IN ORGANIZATION

In Fig. 38 it will be noted that there are two functions which do not occupy so important a place in modern industrial organization as their importance justifies—coordination and counsel. The management, facilitation, and performance functions are the ones which are usually emphasized; in fact we rarely find a proper balance of the five functions shown.

Yet imagine what would happen in the human body if there were only a few of the five senses, and no solar plexus; or in military warfare if military intelligence was neglected, and military planning conspicuous by its absence.

Outstanding successes in industry give due consideration to coordination and counsel, because, in the last analysis, these functions are staff functions, counsel having to do with the “formulative” side, and coordination dealing with the “control” side.

It is, therefore, important to give some consideration to the matter of what we mean by “staff.”

STAFF ORGANIZATION

Let us go back to the Franco-Prussian War and have Harrington Emerson tell us, in his vivid way, about staff in the military organization. In “Twelve Principles of Efficiency” (pages 17–18) he says,

It is not the pomp and glory of that campaign that appealed to me as I intimately and personally, both in Germany and in France, watched it from start to finish, for there was little of either; but the calm merciless skill of the play showed me what principles could do when carried in effect by a suitable and competent organization. It was not the German soldiers who won the war; Von Moltke would have won equally well had he applied his principles to Italians, Austrians, French, Russians, Japanese, or Americans. The German recruits were not enthusiastic and were below the European average in martial enthusiasm and spirit. It was not the German drill or tactics that won the war—mere methods—both long ago superseded. It was not the German equipment—mere devices—that won the war. It was not German

money that won the war, for France was at once far richer and had far better credit.

From an earlier book "Efficiency" Mr. Emerson says (pages 59-62),

It is Von Moltke's greatest claim to fame that he perceived the deficiency of line organization in the army and supplemented it with the general staff which made the Prussian army the marvelously supreme organization it became shortly after 1860. The theory of a general staff is that each topic that may be of use to an army shall be studied to perfection by a separate specialist, and that the combined wisdom of these specialists shall emanate from a supreme staff. The specialist knows more about his one subject than all of the rest of the army put together, but the whole army is to profit by his knowledge. One man may be the authority on military maps, another on balloons, another on sanitation, another on explosives or rapid-fire guns, an ever widening list. Nothing is to be left to chance, or to individual ignorance or brilliancy.

If a man has special military aptitudes, special genius, the staff is the place for its opportunity and development. In the line special genius only makes trouble. Nominally, under Von Moltke's plan, the line remained supreme, the highest command being vested in the King of Prussia, though he was merely the spokesman for staff plans, even as in England the monarchical line is supreme with its personal staff of earl marshals, etc., yet all the real power lies with the cabinet, a staff organization. It was owing to staff knowledge and staff plans that in 1866 the Prussian army, two weeks after the outbreak of hostilities, overthrew the combined armies of Austria and of South Germany. It was owing to staff organization that the united German army of 1870 on Sept. 2 at Sedan decided the war against France, declared July 14. The French plans for mobilization required nineteen days, but Von Moltke's plan for German mobilization required eighteen days, and it was strictly carried out in neither more nor less days than the eighteen. The French mobilization took twenty-one days, and this delay placed the seat of war in France instead of along the frontier or in Germany. French officers were not even provided with maps of French territory. The French plan of campaign failed before it was even tried, because of the fatal three days' delay.

There might be a feeling on the part of some that it is a mistake to use military warfare as an object lesson for industry. The author is not advocating militarizing industry—far from it. The business of warfare, however, is the

ORGANIZING A BUSINESS

oldest business we know anything of. It is also the largest single organized business in the world. Warfare has had to be efficient to insure winning, and to keep death and destruction at a minimum. As a result, a science and an art of war have resulted, and industry can profit from a proper and right modification to industrial uses of military law.

COORDINATION

By coordinating diverse elements, we are able to control the result. Traffic control in a large city is what is meant.

The United States is made up of diverse elements, the several states, each state a sovereign entity and independent of the others. Were it not for coordination, we would have a condition here that would be on a par with a like number of nations abroad. Our states are coordinated, however, to secure a given result—the greatest good for the greatest number of people—by a centralized control in the form of the government at Washington.

In an unusually successful business it will be found that this function of coordination is given due consideration, that the results may be controlled in the interests of the owners, of those who work for it, and of those who buy its products.

General Motors is an example of this fact, as will be seen from these words of Donaldson Brown, vice president, in a paper before the American Management Association, in 1927:

Obviously, such a condition renders it impossible for General Motors to have a centralized organization in the sense of functional responsibilities. Each one of its divisions, from the standpoint of administrative management, has a fully self-contained organization, with a general manager, responsible over all the usual functional activities, such as engineering, purchasing, production, and sales; and including financial control. Yet, as an institution, having to account to its stockholders for constructive progress, General Motors must justify its corporate existence. There must be a sound measure of centralized control so as to assure the proper coordination of its various activities and the ability to capitalize, to the maximum degree, the great advantage derived from its combined size and importance in the industrial world.

PROFIT ENGINEERING

This function of coordination will be the subject of the next chapter.

COUNSEL

The author defines management as "the wise use of coordinated knowledge." Knowledge consists not only in what we know ourselves, but in what others know that can be of use to us.

As business grows in size and complexity, there arises a need for not only tapping the "mental storehouses" of our own personnel, but bringing to their aid from the outside all that may be necessary in the way of supplementary counsel.

Lawyers, bankers, auditors, appraisers, tax specialists, engineers, business counsellors, and many others constitute those from the outside who can help in aiding a given personnel to make greater profits than if they relied entirely upon their own experiences and abilities.

This great fact is recognized by General Motors Corporation, as is evidenced by these words by Alfred P. Sloan, Jr., in his talk to the Automobile Editors of American Newspapers, Sept. 28, 1927, as follows:

In addition to this, the corporation maintains an organization in Detroit as an advisory service for the benefit of all. The Research activity which you have visited acts in a consulting capacity for the engineering departments of all the divisions and, in addition to this, is constantly searching for new principles and ideas of a more fundamental and scientific character than would be possible for any of the individual engineering departments, which must be more concerned with immediate production problems. Legal and patent problems, as well as the financial and accounting control, are handled in a similar manner. Sales research is also a very important activity. In no case, however, is the responsibility taken away from the head executive of each division. When differences of opinion arise, and differences of course do arise, they are discussed and considered from every standpoint, and there has not been a single case that I can remember since I have been operating in the past three years but what, as a result of such discussion, everybody was agreed as to the proper course to pursue.

ORGANIZING A BUSINESS

ELABORATION OF INDUSTRIAL ORGANIZATION PARALLELING THE HUMAN-BODY ORGANIZATION

A business has three distinct entities: corporate or administrative, executive or managerial, and operative or performing.

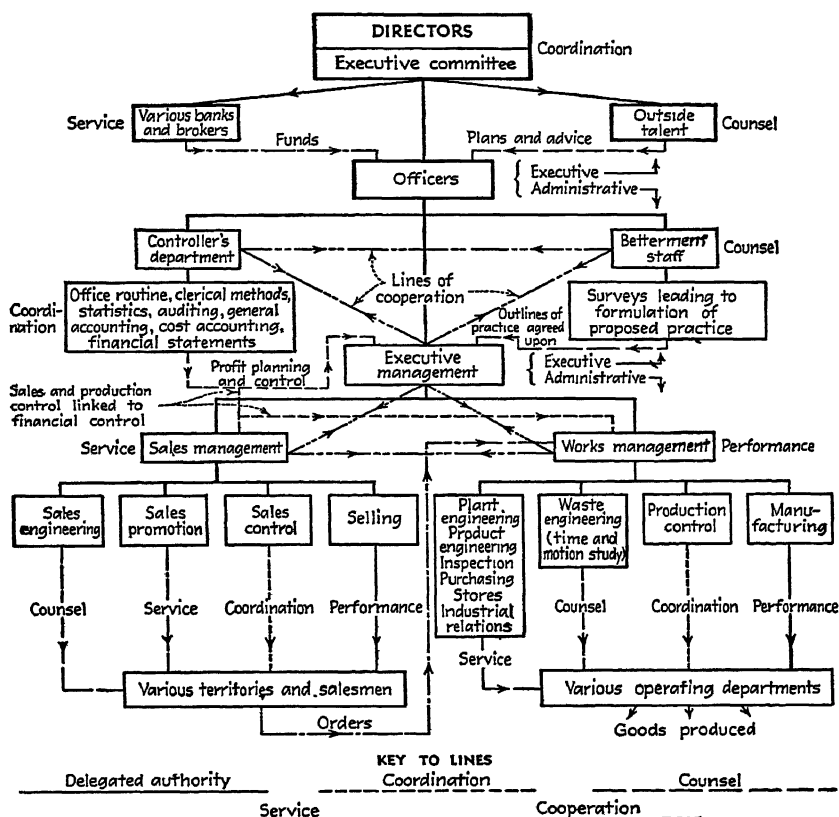


FIG. 39.—Chart of industrial organization patterned after the model organization.

A position has a dual relationship: administrative or staff to those under it, executive or “line” to those above it.

Hence, we can describe organized relationships as follows:

Corporate or administrative.

Officers as *direction* section served by:

Banks and brokers supplying funds, as *service* section.

PROFIT ENGINEERING

Outside talent—lawyers, engineers, and the like, as *counsel* section.

Directors and executive committee, as *coordination* section.

Executive management as *performance* section.

Executive or managerial.

Executive management as *direction* section served by:

Selling, as *service* section, covering engineering, promotion, control, and selling.

Betterment staff as *counsel* section.

Controller's department as the *coordination* section.

Works management as *performance* section.

Operative or performing.

Works management as *direction* section served by:

Divisions covering plant engineering, product engineering, inspection, purchasing, industrial relations, as the *service* section.

Waste engineering, time and motion study, as the *counsel* section.

Production control covering materials, orders, tools, and plans, as the *coordination* section.

Department heads in line departments, as the *performance* section.

In Fig. 39 will be found a complete adaptation to industrial uses of organization in the human body and in military warfare, in a way to set up an "ideal" plan which can be used as a guide in providing a real organization of cooperating personnel for a given situation.

THE BETTERMENT STAFF

The functions of a betterment staff are as follows:

1. Conduct investigations of all kinds, on its own initiative, or at the request of others, to discover waste and inefficiency.
2. Conduct tests or make researches, in an effort to better things.
3. Develop proper tentative standards, as well as formulate what standard practice should be.
4. Devise the methods necessary to put new practice into operation.
5. Prepare instructions covering the procedures decided upon.
6. Ascertain accomplishments, so as to compare with standards.
7. Investigate reasons for failure to attain the standards set.
8. Analyze errors, delays, complaints, rejections, and the like.
9. Survey field constantly, so as further to refine or better the existing standard practice.
10. Maintain proper staff files, adequately indexed and cross-indexed, for quick reference and study of important material.

Regarding the qualifications of the one to place in charge of a "betterment staff" are the following:

1. Ability to analyze.
2. Constructive imagination.
3. Vision regarding the future.
4. Good personality.
5. Aggressiveness.
6. Tact and diplomacy.
7. Willingness to share spotlight with others.
8. Patience.
9. Ability to present views in simple, clear-cut, and systematic manner.
10. Energy and willingness to work.

Another important consideration is that of coordinating staff and line, of harmonizing them, of avoiding conflict, of making it difficult to determine where staff formulation ends and line acceptance begins. This is the task of the chief executive, through a proper and systematic conference program, in which simple conference procedure and records of discussions are important factors.

What will a betterment staff cost? A well-organized and properly functioning staff will cost merely the advances against later results. If such a staff cannot net a return of from three to ten times the cost, and more in exceptional instances, then the staff is poorly organized, or, if rightly organized, it doesn't function properly.

SYNCHRONIZING MONEY AND MEN

A business deals with two great factors, money and men—that is, a successful business does. The other kind seems to be blind to all considerations but that of money. Inasmuch as it is men who use and make money, it is obvious that men should be given the major attention, but in a way that will keep money in sight at all times. How can this be done?

Figure 39 is a master chart of functions and relationships, with due consideration given to the principles of staff and line, administration and execution, service and control. With names filled in, the chart becomes a "man" chart.

PROFIT ENGINEERING

From these men certain results are expected. There must be a definite income from sales in a year, with the outgo kept within definite cost limits to provide for sufficient margin between the two, to take care of financial adjustments, interest charges, dividends, and addition to the surplus account.

The organization chart should, therefore, be broken down into its many various sections, showing names of function, department, title, and individual. In addition, the results expected at "fixed" budget should be inserted, showing amount and cents per sales dollar as well as cents of divisional dollar, as shown in the two sketches which follow:

Selling	
Sales Department	
Director of sales	Sales income \$2,000,000—\$1.00
John Smith	Sales expense \$400,000—20¢
Advertising	
Advertising Department	
Director of advertising	Advertising budget \$100,000:
George Hyde	5¢ of sales-income dollar 25¢ of sales-expense dollar

The master chart should then be redrawn to incorporate the financial factors covering the whole business.

Such a method of charting would synchronize money and men according to functions, in a way to make the presentation dynamic and appealing to all concerned. It would provide an objective as to organization arrangement and a

ORGANIZING A BUSINESS

target as to results expected from all. Money and men would be coordinated on a basis that would assure making the required profits.

LAWS OF ORGANIZATION

Just as there are laws of military warfare, and laws governing the human body, so there are laws of organization. These laws as they occur to the author, are as follows:

1. *Objective*.—Working up a tentative plan with reference to the ultimate development desired.

2. *Greatest Complication*.—The determination of the most complicated phases of the objective.

3. *Concentration*.—Placing in each division of a business all of the factors which affect the performance of its own function.

4. *Specialization*.—Dividing the work so that a man may operate in limited rather than in many diversified fields, in order that a few things may be done thoroughly rather than a large number superficially.

5. *Mental Capacity*.—Dividing work in an organization with reference to the knowledge and ability that will be required of a man in charge of one or more functions or details of a business.

6. *Personnel*.—Analyzing the requirements of given positions, and finding men whose qualifications match the analysis of those requirements.

7. *Individualism*.—Placing in the hands of one man, most competent to handle the work, one or more functions or details of a business.

8. *Relationship and Instructions*.—Providing a man with a clear-cut conception of the relationship existing between himself and his associates, as well as with a written outline of duties, functions, responsibilities, results expected, and methods affecting his work, or instructions covering same.

9. *Responsibility*.—Holding a man responsible for the total proved results he secures in his division or work, giving him the necessary authority and facilities that will enable him to secure the desired results.

10. *Permanency*.—Training men to fill other positions than their own, and providing for understudies so that changes in an organization may easily be made without disruption.

11. *Cross Fertilization*.—Giving each pivotal man in an organization some opportunity during the year to learn the methods of the departments his work influences, as well as of the departments which influence his work, also giving men a change of work to avoid monotony.

12. *Staff and Conferences*.—Organizing an investigative, advisory, and formulative function, and creating a conference plan to make it

PROFIT ENGINEERING

difficult to determine where staff advice ends, and line acceptance begins.

ORGANIZATION AND PROFIT MAKING

Regardless of which field of activity one may care to investigate, it will be found that success and organization go hand in hand. Tammany Hall, a circus, the Twentieth Century Limited, an ocean vessel, an automobile, sports like football and baseball, and the erection of the Empire State Building in New York, are examples of efficient organization.

Failures, on the other hand, whether on the part of men or institutions, are due either to lack of organization or to organization "gone to seed" and degenerating into disorganization. The most noteworthy example of this fact in recent times is the case of President Wilson's unsuccessful efforts to take to the League of Nations the leadership and direction of the United States.

In the business of profit making the same principle applies. If profit making is organized for, along proper lines and with due reference to laws and correct procedures, the net result, over a period of years, can be nothing else than a profitable result; whereas to give scant attention to this vitally important subject merely invites ultimate disaster.

It was for this reason that a chapter on a seemingly dry and uninteresting subject was included in this text, in the hope that the concern really wanting profits hard enough to do the things necessary to make them, would go to work in organizing to "assure" making them.

CHAPTER XVIII

THE MODERN CONTROLLERSHIP IN BUSINESS

Management is broadening, and its application widening to secure certainty of control over everything that is done in and by an industrial establishment.

When cam-controlled automatic machinery came into use, the cam device was called the "brain wheel." In industrial operation we are seeing the rise of a managing department which may well be called by analogy the "brain department." In using this term there is no suggestion that brains are not present, needed, and used in every department, but rather that one department must bring all decisions and actions into harmony, as the human brain does for an individual, and the "brain wheel" for an automatic. Today industry is far too complex to determine anything for one function or department without harmonizing the decision with every other function or department. Sales in kind and volume must be only what can be produced; purchases must meet production needs; production must fill customer's orders; financing must be adequate and honest; the personnel relation must be just. Thus arises the need for a next step in American management—master control.—L. P. ALFORD, in *Management Engineering*, May, 1923.

Profit is like gold. It will not come to one. It must first be located and then dug for, and the best kind of digging for profit in business is that which is done through the organization of men and the control of money.

The previous chapter dealt with the matter of the organization of men. This one will consider the control of money. In this connection, the essence of the previous chapters can be stated in the form of a principle:

Organize for efficient performance by personnel; plan profits in advance; deduct them from sales income; budget the business on a variable basis to "live within the balance"; and then provide control

PROFIT ENGINEERING

machinery analogous to "production control," in charge of a competent man, thus assuring the profits required by the business.

FINANCIAL CONTROL

Evolution in business is in the direction of an organized control of the financial aspects involved—a control from within rather than an external control. That this is inevitable is evidenced by the comment of the then general manager of one of our largest associations of manufacturers in a given line, who said that his industry was illustrating the fact that financial control must be the real control. He stated that different firms in his industry had gotten into difficulties because the purely sales or production type of management did not understand fundamental financial conditions and relationships.

Because of this fact we have witnessed the gradual rise of a new function in business—the modern controllership—a function as important as that of sales or production. Owing to its importance in today's scheme of things, and to the unmistakable place it will occupy in the future as the "coordinative agency" in business, we felt it should receive special attention in our considerations of profit engineering.

INTERPRETATION OF "MEANINGS" AS KEYSTONE IN CONTROLLER'S WORK

Count Herman Keyserling, the German philosopher, tells us that *facts, as such, do not count at all*. He goes further and informs us that ideas must each time pre-exist their expression; that *meaning*, not fact, is the primary principle; and that each new meaning must create new facts. He tells us more about what he means in these words (article "The Alphabet of Life," in *The Forum*):

It is meaning which creates the different organs in the living body, or else there could be no cooperation and no vicarious action. It is meaning which creates the body as a whole. It is the significance of the particular person within his social surroundings, not the person as a fact, which gives him his social position. Again, significance, not fact, is the essence of historical greatness; a man of a particular type rises to power

THE MODERN CONTROLLERSHIP

only when his personal tendencies are representative of the aims as a whole."

In this connection, Woodrow Wilson once said that whole worlds of facts are waiting to be discovered through inference. Both Einstein and Millikan have proved this to be so in their discoveries of relativity and cosmic rays.

Before dismissing these statements as absurd, let us consider the significance of the viewpoint. You will recall that a man once sat under an apple tree and observed an apple fall. An idea flashed into his mind. By inference he was struck by a new significance; a new meaning had come to him about falling objects, out of which came the discovery of the laws of gravitation by Newton. Thousands before his time had observed apples falling, but Newton was the first to "see" something more than the mere fall, out of which came a world of new facts, which, while always in existence, did not mean anything because divorced from meanings.

Then, there was the lad who sat watching the rise and fall of the top of his mother's tea kettle. Something about the more rapid motion and the higher and higher travel of the top gave him the idea about the use of steam as a power, with which men previous thereto were unfamiliar. A new meaning caused Watt to go to work on a voyage of discovery of facts, again always in existence but unrelated, from which came the steam engine.

A man named Réaumur spent years studying wasps. He noticed the paper-like substance out of which they made their nests. He observed what they ate and analyzed how they digested their food. Inference pointed the way to certain conclusions, out of which came the discovery of new facts. This was the genesis of our modern pulp-paper industry, the process of which we are all more or less familiar with. One of the machines in this process is known as the "digerster." *Significance led to these discoveries.*

In other words, give an ignorant African savage a modern telephone set, and he will take it apart and, after looking over the parts, will probably throw them all into

the river. The telephone as a fact is there, but it is of no value or use to the savage, because to him it is without any meaning.

On the other hand, let one of an inquiring mind, who knows nothing at all about the telephone, study the life and activities of ants for any length of time, and he learns that, by momentarily touching their antennas, they convey to each other a whole series of complete and detailed instructions, covering places to be visited and work to be done. At some time during the process he will suddenly stop, because an idea—a fundamental meaning—has flashed into his mind, for by inference he concludes that if ants can do this, why cannot man do the same thing over wires? Out of it all comes the discovery of facts which did not exist before except as detached and unrelated things without significance, which ultimate in the development of the telephone. As you will see from this way of putting things, it is significance which creates facts, not *vice versa*.

The tools used by the minds of men in the creation of facts based on new meanings are the twenty-six letters of the alphabet and the ten digits, with which men express and record their thinking. These are essentially the tools of the controller.

Part of the "keystone" of the controller's work, then, is that of the significance of meanings. From the standpoint of the other part of this keystone, let us present the views of Dr. Glenn Frank, president of the University of Wisconsin. In informing us that the future of America is in the hands of two men—the investigator and the interpreter—he advises us that while the investigator advances knowledge, *the interpreter advances progress*. He goes even further and says that, while we have an ample supply of investigators, there is a shortage of readable and responsible interpreters, because the investigator is not always the best interpreter of his own discoveries.

In Dr. Frank's statement, he says, in an article "Democracy of Thought," in *Child Welfare Magazine*,

THE MODERN CONTROLLERSHIP

A dozen fields of thought are today congested with knowledge that the physical and social sciences have unearthed, and the whole tone and temper of American life can be lifted by putting this knowledge into general circulation. But where are the interpreters with the training and the willingness to think their way through this knowledge and translate it into the language of the street?

If, therefore, you bring together the implications of these bits of philosophy about "meaning" and "interpreta-

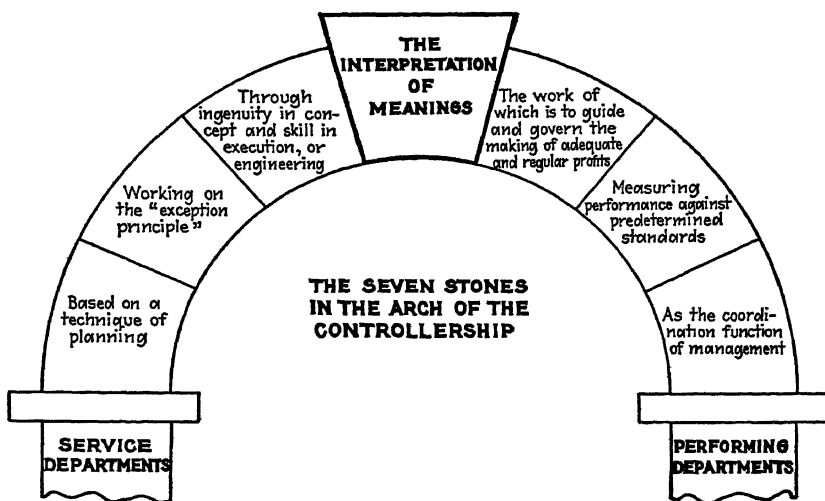


FIG. 40.

tion," you can see why the keystone of the controller's work is that which the author will term the *interpretation of meanings*, in which facts, as such, are merely by-products.

Lest you feel that the author's head is in the clouds, and his feet miles off the ground, let him give you an illustration of what he means, the force of which you cannot dodge. He refers to Harrington Emerson's conception, over twenty years ago, of costs stated in terms of what they should be rather than in terms of what they actually are. This was a new meaning at the time and was followed by G. Charter Harrison's practical interpretation of the discoveries leading from the significance of Emerson's thought of predetermined *versus* historical costs, from which has

come a technique known as "standard costs." To the business world, Harrison has been an "interpreter of meanings." Emerson advanced knowledge, but Harrison advanced progress.

This gives us the first of seven stones in the controller-ship arch (Fig. 40).

THE MEANING OF CONTROL

We now come to the matter of the meaning of the word "control." Obviously, if a controller is to have any influence in industry, particularly from the standpoint of making it profitable, he must know what is implied by the word and be governed accordingly.

"Control" comes from the Latin "*contra-rotulus* (against-roll or check-scroll), whence the French *contre-rôle* (against a roll or counter-roll or check-scroll). As its secondary meaning, *rôle* signifies "a part or function assumed by anyone." From the Greek we get the equivalent as "catalogue," which means "to pick out, count, list down completely."

So, then, we can build up a meaning for the word "controller," as one who takes the part or assumes the function of picking out, counting, and listing down completely, against, contrary, and in opposition to.

Now, the essential thing to know is: against, contrary, in opposition to *what*? The answer is that the controller's work is primarily that which is against, contrary, and in opposition to "losses in business." Supporting evidence in favor of this concept is given in the words which comprise the definition of "control" as "to exercise restraining influence over; curb; hinder; counteract; subdue." Is there any greater work than to have influence over; curb; restrain; counteract; and subdue business losses?

If, therefore, the controller's work is primarily directed against, contrary, and in opposition to business losses, the corollary is that his work is "for and in the direction of profits," in which the other words of the definition of "control" come to the front—such as "rule, govern, guide."

THE MODERN CONTROLLERSHIP

This viewpoint of control is the second stone we can place in the controllership arch.

CONTROL AS ENGINEERING

We must also consider another important factor. The word "engineering" comes into our consideration in a major way. We do not mean engineering as usually defined as "the art of managing engines; the art and science by which the mechanical properties of matter are utilized in structures and machines."

We mean engineering from the standpoint of the French *engin* meaning "skill," and the Latin *ingenium* signifying "ingenuity." From the science of electronics has come radio engineering. Is not the radio a product of human ingenuity in concept, and human skill in translating concept into practical reality? In this sense, the controller who uses ingenuity in concept, and skill in translating concept into intelligent action, is just as much an engineer as those who have given us the radio. You see, therefore, why engineering and accounting must become synchronized if there is to be real control in business. This gives us the third stone in the controllership arch.

RELATING ACTUALS TO PREDETERMINATIONS

In unfolding what to the author is an amazing concept of what the controllership really means, we should be thankful that Einstein has given us his theory of relativity, because relativity is a greater factor in the controller's work than many realize. To tell you that one has made a profit of 6.5 per cent, while a fact in itself, is meaningless until we find what it is 6.5 per cent of, as well as what it should be. In other words, the only safe basis that the controller can operate on is the premise that what a business does—in whole or in part—is of no consequence whatever until there is something against which to measure the accomplishment. This, as you can see, spells *standards based upon predeterminations*. This is our fourth stone in the controllership arch.

PROFIT ENGINEERING

THE EXCEPTION PRINCIPLE

The work of the controller should be with reference to "exceptions." Significance, meanings, interpretations, and explanations should be given major attention. In dealing with salesmen, supervisors, and many of the executives, however, minor attention should be given to statements, charts, and statistical data, because reams of such things only serve to give them "mental indigestion." All the essential records necessary should be maintained by the controller and his staff in procuring information about a business, but what should go forth are conclusions, opinions, formulations, the consequences of this move or that, all in predigested form, and supported by only enough data to drive the points home. Then executives will welcome the visits of the controller and his subordinates; in fact they may do some of the visiting themselves because of the "dynamics" of the process. This we can place as the fifth stone in the controllership arch.

PLANNING

The next factor should require little argument—that of planning. If Russia can develop a five year plan for an entire nation and substantially attain it, as the experts tell us she is doing, if we can plan our production in our shops to the extent which has made our mass production possible, can we not conclude that the elements of the controller's profit and other work can, likewise, be planned? Planning is the sixth stone in the controllership arch.

MANAGEMENT'S COORDINATION FUNCTION

The final factor of the seven we desire to present as stones in the arch of the modern controllership is that which has to do with the controller's place in our economic scheme of things. In other words, where does he fit into the organization picture?

The controllership, as the author sees it, is the "industrial solar plexus," coordinating all the essential business facts,

THE MODERN CONTROLLERSHIP

as the basis for the determination of correct policies and the making of intelligent decisions based on the policies determined upon.

A controllership on this basis would be subordinate only to the chief executive, and on a par with the general manager in charge of service departments and sales and manufacturing, thus linking staff coordination and line direction. Such a controllership would view a business from markets and studies made thereof, through to goods shipped and posted to the accounts receivable ledgers. Such a controllership would be management's "left hand" with the "right hand" looking after the service and performance divisions of the business. This seventh and last stone can now be placed in the controllership arch.

THE ARCH OF THE CONTROLLERSHIP

Let us now stand off and view the completed arch in Fig. 40. In words, we can describe the controllership as *the interpreter of meanings; the work of which is to govern the making of profits; through ingenuity in concept and skill in execution (or engineering); measuring performance against predetermined standards; working on the exception principle; all based on a technique of planning; as the coordination function of management.*

The author has painted a picture, as he sees it, of the controller's part in making industry profitable. The part is far from being a minor one. It calls for vastly more than a knowledge of accounting and costs. It is concerned with much more than what is embraced by the word "finance." Few at present occupying the controller's chair measure up to the specifications which have been outlined. On the other hand, pause and mentally picture the splendid opportunities ahead when more and more of them do measure up to them, as they ultimately will.

THE WORK OF THE CONTROLLER'S DEPARTMENT

In the foregoing we have considered what might be termed the philosophical aspects of the controller's place

in a business. We now come to a brief outline of specifications covering his work. This is not an easy task, because, in the last analysis, the local conditions in a given case should govern what must be included among the duties of this important officer.

This matter is further complicated by the deplorable lack of a clear-cut line of demarcation between the work of treasurer and controller, as well as of an understanding of their relationships. This is accounted for in a measure by the fact that the treasurership is as old as business, while the controllership is a comparatively recent development. To clear up part of the uncertainty, however, it may be said that the controller should in no way be subordinate to the treasurer. The treasurer is a corporate officer, elected by, and subordinate to, the board of directors. The controller is a managerial officer, selected by, and subordinate to, the president.

The balance of the uncertainty may be cleared up to some extent if we will look upon the treasurer as the one in charge of:

1. Receipt and disbursement of all funds.
2. Making all loans and investments.
3. Credits and collections.
4. Strictly legal and corporate aspects of the treasurer's positions now considered as standard practice.
5. Financial reports to the board of directors.
6. Control of capital expenditures.
7. Miscellaneous matters like pension plans, current interest rates, foreign exchange, income-tax returns, insurances, stock plans for employees, listing of stocks on exchanges, valuation of assets, and the like.

There should, of course, be the closest cooperation between the treasurer and the controller, and, to the degree possible, the functions and duties of each should be divided into logical and well-defined elements directly relating to the work of the corporate and managerial phases of financial administration. In so far as it is possible, no work belonging to one should be assigned to the other. These are matters

THE MODERN CONTROLLERSHIP

for the president and his board of directors to work out and, if they cannot, an unprejudiced outsider should be brought in to assist in deciding which work belongs to each of these positions.

In a general way—and with no thought of laying down any hard and fast rules for the guidance of a particular case—the following may be considered as the elements within the scope of the controller's department:

1. Preparation of and betterments in balance sheets, income statements, and cost reports.
2. Coordination of sales, production, and financial control.
3. Mechanical punching, sorting, and tabulating.
4. Taking and figuring of inventories.
5. Various ledgers—general, accounts payable, accounts receivable, equipment, stores, and pay roll.
6. Preparation of data covering cost plus contracts.
7. Economic research.
8. General and cost accounting.
9. Office methods and routine procedure.
10. Inventory minimums and maximums.
11. Budgets for the business as a whole, based on the variable principle.
12. Library and the indexing and cross-referencing of all important data.
13. Preparation and presentation of the proper managerial charts.
14. Analysis of financial components and relationships.
15. Financial forecasts.
16. Auditing of treasurer's accounts.
17. Approval of all vouchers for payment.
18. Countersigning checks.
19. Interpreting factual data to management, on the "exception" principle.
20. Determination of profit formulas and the calculation of results.
21. Variation accounting.
22. Standard costing and relation of actuals to standards.
23. Appraisal of results in terms of effect on profits.
24. Development of yearly and monthly moving averages for three- to five-year period, covering pertinent factors.
25. Inauguration of means to plan what the business will be like three to five years hence.
26. Statistical work for the various departments.
27. Conducting a "business clinic" for the discussion at different times by different groups of the pressing problems before the business,

PROFIT ENGINEERING

these to be attended by such groups as workers, clerks, salesmen, and executives, with an occasional meeting at which all attend.

28. Depreciation and obsolescence problems.

29. Investigate and report on any phase of the firm's activities, working directly or through the betterment staff.

30. Attend all meetings at which policies are discussed and formulated.

31. Attend all meetings of the board of directors as the representative of the president.

32. Attend management conferences when factors concerning two or more functions of business are under consideration.

33. To report on recommendations for additions to buildings or equipment, or major replacements of equipment.

34. To report on effects of contemplated price changes.

35. To report on recommendations covering additions of new lines, betterment of present lines, or elimination of old lines.

36. TO BE IN CHARGE OF THE WORK OF PROFIT PLANNING AND CONTROL.

THE SUPERCONTROLLER

The author wishes at this point to paint a word picture of the new type of controller as he sees him. The scene is an ornate room in the offices of a large and well-known firm in a New York skyscraper—the directors' room. There are fifteen or more men around the table. It is dividend day. There is a large cash balance, the surplus is sizable, business is excellent, and the prospects are very bright for a continuance of good business (this was some years ago). Seated at the side of the chairman of the board is a man who is neither stockholder nor director, and he seems to be taking no particular interest in the proceedings.

The regular business is transacted. One of the directors makes the usual motion that the customary dividends be declared. The question is put. Then this man seated by the chairman comes to life and mildly suggests that the dividends be passed. It needs no imagination to visualize what transpires immediately thereafter—consternation, anger, argument, in fact, everything in the category. This man is armed with statements, charts, and general data which indicate that within sixty to ninety days certain things are likely to happen, and that, if they do, cash in large amounts will be needed.

THE MODERN CONTROLLERSHIP

To make a long story short, this man had no power to stop the declaration of dividends. The directors had the power to order them paid. But they passed them nevertheless, because this man knew more about the business than the officers and directors.

He was only the controller. At least that was the word which appeared on his business card. He was something more, however, a "supercontroller," for within the sixty to ninety days mentioned, many of the things which he had predicted did come to pass. Thereafter he was looked upon as a very important cog in the business machine.

MASTER CONTROL

Our vast and complicated business mechanism is becoming more vast and more complicated as time passes. A modern business is like an automobile with a high-powered engine of eight cylinders, in which the eight factors are finance, plant engineering, product engineering, purchasing, manufacturing, advertising, selling, and personnel relations. Management (the driver) must watch the road ahead all of the time, while keeping its eyes on what is happening on each side and, in addition, must both steer the machine and regulate its speed. The larger the machine and the faster the travel, the greater the need for managerial care. Without control of the most efficient kind, the business machine will skid, crash against obstructions, or go over an embankment.

Managing executives will be powerless to pilot this modern machine in the future unless they provide the kind of control herein urged and place the direction of this controlling mechanism in the most competent hands. We are dealing in billions where we were content previously to consider millions, and millions where thousands were the rule before. Decisions will have to be made quickly, or severe losses will be sustained. Each decision will involve varied and sizable considerations. Control there must be or the highways will be strewn with business wreckage. Wise managers are providing this modern control; the foolish ones will wake up when it is too late.

CHAPTER XIX

GREATER PROFITS THROUGH TAPPING HUMAN POWERS

It isn't enough to produce steel in a mill.—**DAVID GRAYSON**, in "Adventures in Understanding."

It [the report] discloses losses and waste due to the restraint and dissipation of the creative powers of those who work in industry. It lays the foundation for knowledge of the destructive influences which have too much controlled in the past. From this knowledge will grow the conviction that mental and moral forces must be added in a much larger degree, to the physical forces now being employed, if industry is to serve all who are dependent upon its continuous and effective operation.—From report, "Waste in Industry," of the Hoover Committee on Elimination of Waste in Industry. (McGraw-Hill.)

Problems in human engineering will in the future receive the same genius that the last century gave to engineering in more material forms.—**THOMAS A. EDISON**, in "Industrial Executive."

Business is generally accepted as being the production and distribution of goods that the needs of man may be supplied. This is far from being all of the story however. If we were concerned with mere needs, that would be one thing. But man is not satisfied with necessities, else the clothes he used to wear, food of the plainest variety, oxen and horses, and a home without electric lights and bath would content him. Man, unlike the animal, reaches out for more and more and better and better things. Is this a vain process? No, indeed. That man reaches out for more and better things presupposes that there are more and better things for him to reach out for. This is so because nature is fabulously rich in laws and forces and materials, which are here for man's use. Nature says to us, "Seek and ye shall find," and in the proportion that man has sought he has found.

GREATER PROFITS

The bee makes the same kind of honey today that was always made. The spider web is no different today from those spun centuries ago. The dam built by the beaver contains not a single improvement since the first dam the first beaver built. It is only man who creates and betters his previous work.

Thus you see that business is an effect, a result. Man is the source and cause, for without man there would be no conquest of nature; hence no business—and therefore, no profits.

THINKING

In considering man from this angle we find that we are confronting an enigma which has puzzled mankind ever since the human's appearance on the stage of life's drama. Man is the greatest paradox in the universe—weak, puny, and utterly helpless on certain occasions, while on others we find him a worker of miracles.

Man cannot make his voice carry for any great distance, but he can devise and build telephone and radio and talk across continent and ocean. His powers of hearing are decidedly limited, so he makes an electric ear that can hear an airplane motor ten miles away. Man's seeing powers are also limited, but he can fashion an electric eye that can count fifty thousand objects a second. He cannot fashion by hand a small, interchangeable screw that is accurate, but by machinery he can make a perfect screw so small that fifty thousand can be put in a thimble. Man's touch is considered sensitive, but not so sensitive as the electric machine which inspects yeast cakes and issues a warning when one has lost its label. Man is not exact as to color matching, so he builds a machine that rejects cigars that are off color. Man is helpless on a ship in a storm, so he builds a gyro-stabilizer that in one case reduced the list from 20 degrees to 2 degrees. Man can measure but a fraction of an inch on a rule, so he makes gauges which are accurate to one-millionth of an inch.

What, then, is there about this strange and almost unknown figure—man—which enabled him to reduce the time for circumnavigating the globe from 1,000 days to 21 days; to increase the time of the Wrights in the air from mere seconds to 420 hours and 21 minutes; and to decrease the time required by Columbus in crossing the Atlantic from 71 days to 4 days and 14 hours? There is but one answer—his powers of thinking.

Edison once dreamed of sending more than one message at a time over the same wire. Today, in a cable $2\frac{5}{8}$ inches in diameter, conversations can be carried on simultaneously by 3,600 people, as a result of man's thinking. Imagine trying to multiply and divide with the old Roman characters. The change to Arabic numerals and the inclusion of the cipher resulted from nothing more than a mental concept.

Few of us would venture very far on the ocean were it not for a series of up and down and cross lines—purely imaginary lines—which divide the earth's surface into segments. Yet, if one is on a ship in distress, and by radio he gives you the degrees, minutes, and seconds of latitude and longitude, you can go to the exact location of the ship he is on. What are latitude and longitude but the product of man's thinking?

It will be seen, therefore, that we have isolated one of the most important things about man—his thinking—for everything that man has done; everything that man is today; everything that he expects to become gets back to the same cause—that mental process called thinking.

HOW THE MIND OF MAN WORKS

Let us illustrate how the mind of man works by asking you to imagine that we have always lived in one room, that we have never been outside its walls, that we have never read any books or magazines or newspapers, and that we know absolutely nothing about the outside world. Let us assume, further, that three piles of material are brought into the room, which we begin to examine with great care. The attendants who brought them in said that in one pile is a

GREATER PROFITS

ton of iron ore, in another a ton of coal, while in the third is a ton of cement rock. What they said, however, means nothing to us because of the cloistered life we have led. To us these materials are static, valueless, and utterly useless. But, being humans, we are curious. Our eyes tell us that these materials are different. They have color which we afterward learn to be red, black, and olive drab. With our hands we find that per handful they are of different weight. We break up chunks of the ore, the coal, and the cement rock and observe that they have differing consistencies.

We continue the analysis; different ones have different views about what these materials are and how we can use them; we make records of what we learn. In time we begin to see daylight ahead. We find that these materials have three distinct kinds of ingredients, and that they can be put to different uses. In short, we end up by determining that with iron we can make steel; with the coal we can generate steam; and with the cement rock we can make concrete. These materials have now become dynamic, valuable and useful.

We have been researching. *We made a "research" of what nature did when she first searched out the elements she used when she made the ore and coal and rock.* We researched through our "ingenuity" and "skill." That's engineering.

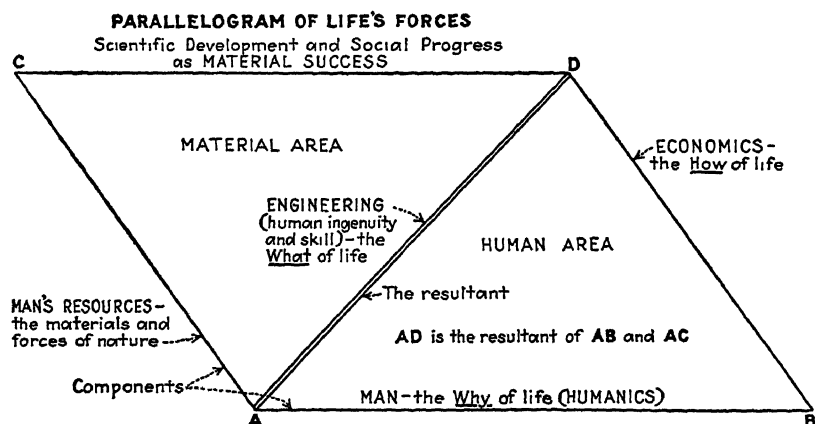
Ingenuity and skill are the great gifts that have been given to men wherewith to discover the secrets of nature—the key that we have to unlock her storehouse of treasures. Nature is not a fickle lady, she only asks that we search out the work she has already done for us.

As prehistoric man, we walked and walked and became tired and fatigued. We probably "wished" there was some way whereby we could get along faster, as it took us so long to travel by foot from place to place. One of us happens to be cutting down and trimming trees with which to make a cabin. One log gets away from him and rolls down hill. An "idea" pops into his mind, an idea directly related to the wish mentioned, out of which comes the development known as the wheel, which eliminates the fatigue and the

PROFIT ENGINEERING

slowness of travel at one stroke. We do not know that this is the genesis of the wheel, but it could have been. At least it is a good illustration. The man eliminated waste, both physical and time waste. He did it through his ingenuity and skill. That's engineering.

Ingenuity and skill have been given to man as a gift whereby he can also improve his past work and better his results; it is the key that we have to unlock the door of human progress, enabling man to rise superior to all human limitations by building greater works on the foundations of others. Nature demands that we eliminate waste.



Research gives us something that to man's knowledge did not exist before. Waste elimination takes what man does know about, as a result of previous research, and makes it more efficient. Engineering is research and waste elimination through human ingenuity and skill. To appreciate better the relation of man and engineering, see Fig. 41.

NO DUPLICATES AMONG MEN

If we were all to be fingerprinted, there would be no two fingerprints alike. Should we speak, one by one, before a microphone, our invisible audience would recognize as many different voices as there were speakers. There are no two faces exactly alike in all the world. Likewise, if we could

GREATER PROFITS

find a way really to inventory the potential powers in each one, there would be no two persons alike in gifts, for the reason that the Almighty created no duplicates among us.

For every hundred workers in factory and office there are one hundred separate and distinct thinking individualities, capable of development in one hundred different ways. Each is like a different musical instrument, capable of producing its own melody and harmony.

In this connection, may we refer to the Parable of the Talents? One of the most significant parts of the recital is that talents were given to "every man according to his several abilities." In other words, every human has been given talents or abilities, some one, others two, and still others five. They were given us to be used, not to be buried. Each one has his place in the great cosmic scheme of things, yet we know that not two out of three or even one out of ten are using their "diversity of gifts" in the great business world in the way that was intended. Fear, ignorance, lack of opportunity, and wrong organization keep the majority of men from contributing what they might to the conquest of nature for man's benefit—and at a profit to all.

EVERY HUMAN CAN CREATE

Let's examine the matter of thinking a little more closely. Thinking can be likened to a *manufacturing* process. The *raw materials* of thinking are facts, meanings, inferences. This raw material becomes *work in process* through imagination and visualization. The *products* of thinking are ideas. *Ideas* are the *source* of all creations. The mind is the *fabrication plant*. Each human has a mind, therefore, each human can create. The secret, then, is to supply the minds of men with facts, meanings, and inferences.

Those who have given us the greatest developments were not considered geniuses, nor were they rich or educated men, experienced in the things they later became noted for. Field, who laid the Atlantic cable, was a merchant. Ford was a machinist. Bell was a professor of elocution, Carnegie a railroad official, Edison a telegrapher, Selden a lawyer,

Eastman a bank clerk, and Harriman a stock broker. No one ever knows where the mental lightning will strike next.

Speaking of genius, the author of "The Art of Thinking" says, "Does creative thought mean genius? Yes, but remember that any creation, of any description, by the humblest artisan as well as by the superman, is the state of mind which ought to be called 'genius'."

If we would use the same care, or even approximately the same care, in inventorying human potentials as we do in watching our materials, counting our cash, appraising our properties, and auditing our books, we would find genius all about us.

Let's see how genius works. A man once studied bees. He studied their habits, their actions, and particularly their results. He found them to be much less efficient than has been claimed for them. He set about to better their work, as he figured they spent too much time and honey in making wax, that they raised too many drones, and that the habit of swarming was a disturbing element in the successful manufacture of honey. He made boxes from which the honey could be removed without disturbing the bees. They were made with such precision that they actually regulated the habits of the bees, diminishing and controlling the number of drones and doing away with the swarming.

These new hives are used by bee keepers all over the world, and the quantity of honey per bee has materially increased. The man who did all this was not an expert on bees. He was a Congregational minister, Lorenzo Lorraine Langstroth. Man's thinking taught the bees something new.

The power that was in James Watt, the power that gave us the steam engine—the power of "creative" thinking—lies in the soul of every man. It may be entirely hidden or only occasionally come to the surface in most men, but it is always there for us to tap for constructive purposes.

After all, names are only tags—man-made tags—to distinguish Smith from Jones and both from Brown. The real man is always the same, regardless of time or location. Creative thinking is your attribute as well as mine—and so

GREATER PROFITS

on down to the floor sweeper. The reasons are simple ones.

In the realm of things material, there is always intense competition. There is no competition whatever in the realm of things mental. If ten men each have two different material things and they trade equally, each will still have two different material things. If the same ten men, however, each have two different ideas, and they trade these ideas equally, each will have his own two ideas—*plus eighteen others*.

The other reason is that all of us have the same identical materials to work with—the twenty-six letters of the alphabet and the ten digits—with which to express the thoughts which come to us. The greatest democracy in the world is the democracy of “headwork” and these thirty-six characters are its tools.

STAFF ORGANIZATION

How are we to induce, focus, and utilize this great power of “creative thinking?” Through what is known as “staff organization,” which was briefly described in Chap. XVII on “Organizing a Business for Profit Making.”

It was no accident that Foch was selected to head the Allied command during the late war. He was selected because he knew more about staff organization in military affairs than any other general living at the time. He had watched it at work during the Franco-Prussian War. He studied it, improved upon it—through his thinking—and built up a war machine far superior to the best the Germans had.

Here is what staff means in a military sense. If a man in the army, private or officer, displays unusual ability, possesses specialized experience, or has constructive ideas, he is taken out of the line or fighting organization and made a part of the staff or planning and service organizations, so that the entire army may have the benefit of what this *one* man thinks and knows. Why should not this be done in business?

If one will stop to consider how man works in carrying out staff work, it will be apparent at once that it is a purely mental process, a product of ideas which come to a man "right out of the air," as Edison once said. Imagine a man saying, "Now I wonder why I am doing this work in this particular way? I wonder if there is a better way to do it? How can I go about finding out this particular way? I *think* I will begin to *think* about it, and perhaps I will find it."

When a man—any man, from day laborer to chief executive—begins to think in this way, whether for part or all of the time, then he is doing staff work. Is there a human who cannot, in some way, be "induced" to think in this manner?

In one large plant word was passed around that there would be an opportunity for a man from the ranks to act as a supervisor of speeds and feeds in the machine shop, before one was engaged from the outside. A planer hand applied. It was found that his "hobby" was speeds and feeds, shapes and angles of tools, kinds of steel, and tempering, forging, and grinding of tools. He was appointed. Can you imagine the effect on this man, promoted from machine to position as staff supervisor? Can you imagine, in addition, the effect on the other men in the plant?

In another plant where ideas were induced in an unusual way, a negro floor sweeper "thought" out a way to do a certain piece of work with sixteen less men than before. He received a check for \$1,000 for his contribution to cost reduction. Such things are the accidents or incidental happenings, rather than something which is a regular part of a definite plan.

ORGANIZING FOR STAFF

In organizing for staff, where will we look for our model? To baseball! What kind of game would baseball be if batters always batted, and pitchers always pitched? Baseball is the great and absorbing game that it is because players *both* bat and play in the field. When batting, they are part of the line or performing organization. Each player, however, is a specialist—one a shortstop, another a catcher, and so on

GREATER PROFITS

through the nine positions. As specialists, each in his particular fielding position, the nine men form the staff organization. In baseball there is a fine balance of alternation of staff and line.

It is this alternation of staff and line that the author so strongly advocates in industry, whereby each man and woman in the employ of a company can become part of the staff for part of the time.

All in shop and office constitute a potential staff. In that staff lie the answers to most of the pressing problems of a business. In one case it resulted in savings of over \$260,000 added to the Profit and Loss Account; in another it provided dividend requirements; in still another, savings of over a million dollars were recorded. The possibilities are enormous in this great work of harnessing and then focusing the mind power of the employees in a business.

Organize an *Idea Department*. Let each person in your employ become part of the staff for part of the time, as in baseball, and you will find that you have a great "thought laboratory." Organize this department in a proper and constructive way as a distinct department of your business, in much the same manner as you would organize for a controllership, and the results in the form of increased profits will amaze you.

In case you feel that we are advocating something radical, look into the work of the Bureau of New Ideas of the Pennsylvania Railroad, and you will find the most eloquent support of what we are contending for. Its late vice president, R. V. Massey says (*Executive Service Bulletin*, Metropolitan Life Insurance Company): "Two years' experience has proved the Bureau of New Ideas to be a worth-while medium for encouraging constructive interest in the company's progress and offering to every employee a wide-open door for the expression of original thought."

Let this "idea department" deal with research and waste elimination; make it the clearing house for problems, facts, and information covering inefficiency; have it work with employees in a qualitative as well as a quantitative way;

let it tap the creative thinking powers of employees by soliciting ideas regarding betterments and improvements. Induce the "spirit of the game" in this staff by providing employees with facts, meanings, and inferences—currently—regarding results as to the quality, quantity, cost, and time, along with the knowledge of the *relative performance* of individual, group, and department, as in baseball and its comparative tables as between players, teams, and leagues, the loss of which would rob this game of half of its interest and pulling power. What would golf be if there was no par performance to play against?

Staff organization, covering an entire personnel, is the next great step in the onward march of a man-building, thought-inducing, profit-making industry.

CHAPTER XX

MANAGEMENT AS THE KEYSTONE IN PROFIT MAKING

The business executive will have to develop a sense of proportion which includes within its horizon an appreciation of human aspirations and a willingness to strive for their attainment. He will have to recognize that there is an optimum, or most desirable measure, in business as in science, and that not even genius can expect permanently and successfully to disregard it.

He will no longer be the production executive, nor yet the financial executive, nor will he, as some hope, be the sales executive. He will be detached from any special interest and open minded toward all. He will have imagination to see opportunities for service and for profit; he will have knowledge, the basis of control; above all, he will have wisdom, the ability constructively to use that knowledge.—HARRY ARTHUR HOPF, before Boston Advertising Club, Mar. 29, 1932.

Reserved until this part of our discussion is the matter of management and its relation to the vitally important work of "assuring required and adequate profits." The wisdom of this is no doubt apparent to those who have read the preceding chapters and have seen that time and time again the trails led to management; *that everything rests on management in the last analysis.*

In other words, accountants audit, appraisers evaluate properties, engineers devise budget and wage incentive plans, merchandise counsellors make market studies, and advertising agencies develop sales campaigns, but seldom is anything like the same degree of attention given that most important of all factors in business—management. Products and properties may be of the best, and capital and credit may be available, yet, unless management is well organized and highly efficient, these "tools" cannot be used profitably.

No result is or can be greater than the worth of the agencies which secure or are behind it, because the effect is merely a reflex of the cause. As things are at the bottom, so you will find them at the top; consequently, if results are unprofitable, the fault can be charged directly or indirectly to management.

As Shibley so eloquently puts it in his "New Way to Net Profits" (Harpers), "It is not an act of God that causes the prosperity of General Motors Corporation, and everyone connected with it, but good management, a management with a definite corporate policy, definitely followed."

The issue, therefore, as to profits or lack of them, is squarely one of good management *versus* inefficient management—nothing more, nothing less.

IMPORTANCE AND RESPONSIBILITIES OF MANAGEMENT

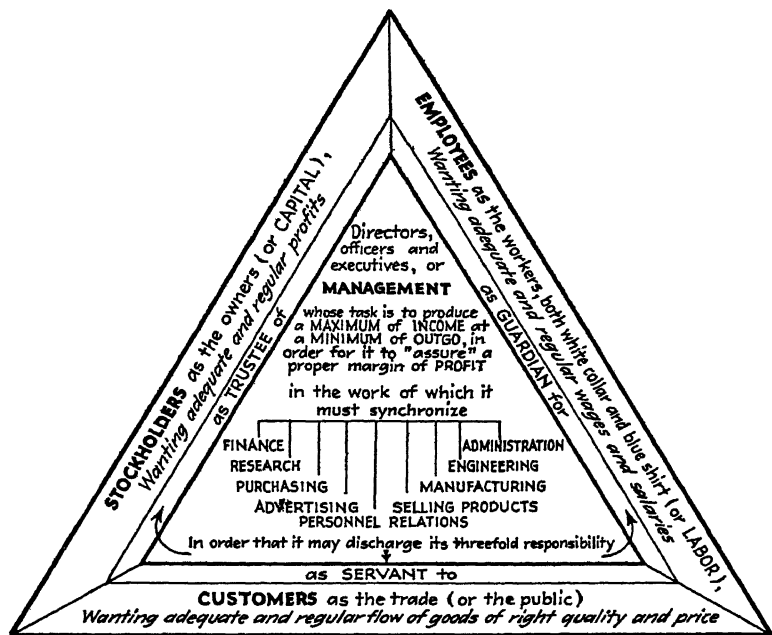
If good management is responsible for the profit success of one out of five concerns, then its opposite—inefficient management—must be the cause of the "pernicious profit anemia" of the four out of the five. The causes of inefficient management can be stated as incompetence, inexperience, extravagance, neglect, and lack of capital (the last never being difficult to secure by efficient management). Behind this charge is all the weight of the failure statistics.

The great pity of it all is that the four out of the five *should* average regular and adequate profits, thus reversing the ratio. And reversing this ratio is the greatest task confronting those responsible for the conduct of our industries. Furthermore, this is not a difficult task, daring and radical as the claim may appear to be. A life-long study of businesses (both successful as well as sick) leads to the firm conclusion that it is easier to be successful than it is to be its opposite, for the simple reason that in working in conformance to economic laws we follow the lines of least resistance, whereas, to violate them is to swim against the stream—which is much more difficult. If managements would but realize that to lose money and be only fairly successful calls for much harder work than to make profits and have a really

MANAGEMENT AS THE KEYSTONE

successful business, it wouldn't be long before better managements would appear in the industrial picture. The secret of it all is to set up definite profit objectives, and then to *want* profits *hard* enough to do the things that are necessary to secure them.

Analyze, if you will, the great industrial successes like General Motors, DuPont, General Electric, American



NOTE. Start from center and work
to outside of triangle

FIG. 42.—Threefold responsibility of management.

Telephone and Telegraph, General Foods, United States Steel, International Business Machines, Western Electric, and the others among the one thousand outstanding concerns of the country, and you will find:

1. That they have a true conception of the importance and place of management in the industrial scheme of things.
2. That they consider themselves as:
 - a. *Trustees* of the owners of the business.
 - b. *Guardians* of the workers, whether blue shirt or white collar.
 - c. *Servants* of the customers they sell to.

This threefold responsibility is graphically portrayed in Fig. 42.

COMPETENCE

Now the vital question is, What are the things to do as a prerequisite to business success? The first is to provide *competence* in management.

The reason for this statement is that industry does not demand that same degree of fitness as is demanded in other lines of endeavor. Personality, what a man says about himself, previous work, and a more or less casual analysis of references form the basis, in too many instances, covering the selection of a person for a responsible management position. A man may go in business because he "wishes" to do so. He "thinks" he can make a success of it. He takes his money, and that of his friends, and establishes himself, without any thought whatsoever of the problems, pitfalls, or what his results will ultimately be.

In professional and specialized lines, definite training, a prescribed course of study, examinations, and certifications as to fitness are required. Those without this foundation would not be allowed to pursue their chosen professions.

Competence is demanded of the following:

Nurses	Railroad engineers
Physicians	Railroad firemen
Surgeons	Army officers
Dentists	Naval officers
Veterinaries	Marine officers
Lawyers	City policemen
School teachers	City firemen
College professors	Priests and ministers
Architects	Engineers of all kinds

To what extent is this true of corporation presidents, general managers, treasurers, controllers, accountants, and many other executives in business making up the management class? Must we not, sooner or later, ask management personnel to demonstrate its competence by tests before being allowed to "practice" in business?

MANAGEMENT AS THE KEYSTONE

What we need, in other words, is to look upon management as a career in the sense of this editorial in *The Saturday Evening Post*, of Sept. 16, 1922:

American industry suffers because in too few instances is trained management regarded as enough of a career in itself. Business enterprises are too often the pawns of ambitious men or financial manipulation. There can be and should be no finer career for any man than the successful conduct of a business enterprise; nor should it be the stepping stone to other ambitions. Certainly the safety of bonds and stocks from the investor's standpoint depends upon the increasing recognition of this type of management.

INITIATIVE

Another of the elements of good management is a proper placement of the various types of initiative. Men can be classified as to their degree of initiative, and such a classification determines where men belong in business. The four main divisions of men as to initiative are

1. The one who conceives things to be done, without being told about them, and then delegates the work to others.
2. The one who conceives things to be done, without being told about them, but who has to do the work himself in order to get results.
3. The one who conceives things to be done, after being told about them, and who then delegates the work to others.
4. The one who conceives things to be done, after being told about them, but who then has to do the work himself in order to get results.

Why not catalogue your own personnel with reference to these four divisions, beginning with the chief executive?

DUTIES OF CHIEF EXECUTIVE

Another element in good management is the right viewpoint of the chief executive with reference to himself. Does he measure up to the requirements of his own job in the sense of this specification?

1. He should develop his own initiative and go further than mere directing. He should organize, guide, coordinate, supervise, using the help of others for well-defined purposes which, when carried out, will contribute to the progress of the whole business.

PROFIT ENGINEERING

2. He must develop initiative in others, so that delegated work which he passes on to others may be handled intelligently to support well-chosen policies.

3. He must avoid tendencies that would make him only as big as his own personality, so that, by coordinating the work of himself and others, he may become as large as the composite of his entire executive personnel.

The third one is the most important of the three. As an illustration of what is meant, Henry Ford, in the author's opinion, typifies the man who is only as big as his own individual self; Alfred P. Sloan, Jr., as president of General Motors, typifies the man who is as big as the composite of his entire executive staff.

ANALYSIS OF PIVOTAL MEN

To enable a chief executive to appraise the worth of his subordinates, the following questionnaire is offered as a means of analysis. The chief executive, with two or three of his principal assistants, would consider these questions with reference to each executive to be examined. The questions are:

1. What work does he cover?
2. Whom does his work influence?
3. How is he influenced by the work of others?
4. What other work is he qualified to cover?
5. Who else can assume his duties?
6. Is he responsive to suggestions?
7. How does he take criticism?
8. Is he spasmodic or consistent?
9. Does he think for himself or depend upon others?
10. Is he a keen, deliberate thinker, or does he jump at conclusions?
11. How is his temper—quick or slow to arouse?
12. Is he capable of self-direction?
13. Is he overworked?
14. Is he a team worker, or a "one-man band"?
15. Considering ability as good, poor, or fair, how do the following check up:
 - a. Judgment?
 - b. Accuracy?
 - c. Executive ability?
 - d. Initiative?
 - e. Cooperation?

MANAGEMENT AS THE KEYSTONE

- f.* Energy?
- g.* Aggressiveness?
- h.* Perception?
- i.* Industry?

SECURING THE COOPERATION OF SUBORDINATES

A questionnaire sent to the executives of an organization, which deals with what they can do to help a management secure greater results, can be of pronounced assistance in getting them to "think with" those at the top. Here are a few of the suggested questions:

1. What is your position?
2. What is your title?
3. To whom do you report?
4. Who reports to you?
5. What are your chief functions?
6. What are your duties?
7. What matters do you attend to that should be looked after by some other department?
8. What matters are looked after by other departments which should be looked after by you?
9. What conditions are there, if any, beyond your control, which interfere with your attainment of maximum results?
10. What are your views as to the future of this business?
11. What suggestions have you which would enable this company to better its results?
12. What plans have you in mind for the betterment of your own work? For the betterment of your department?
13. What steps do you suggest whereby we can induce a greater degree of cooperation on the part of our personnel?
14. What do you consider to be the most important problems before you at the moment? Before this company?

LAWS OF MANAGEMENT

In a previous chapter we set forth what were termed the "laws of organization," which had to do with improvement of the business machine as an arrangement of parts and functions. We now come to what we conceive to be the "laws of management," which have to do with the operation of this machine by human beings. They are as follows:

PROFIT ENGINEERING

1. *Leadership*.—The right organization spirit is cultivated through the type of leadership which inspires others to give the best that is in them.

2. *Status*.—Having placed a person in charge of a given work, see to it that the necessary authority to accomplish results accompanies his responsibility.

3. *Contact*.—The executive who disregards his immediate subordinates, and deals directly with those immediately under them, is both unjust to them and unfair to himself.

4. *Change*.—When new executives are brought into an organization, make due allowances for the change in human relationships, until a basis for mutual understandings has been reached between the new and the old executives.

5. *Counsel*.—Inasmuch as men grow in ability in proportion as they accept the teachings of others who know more about a given subject, the willingness to accept counsel should be fostered.

6. *Initiative*.—Executives should constantly study their subordinates in order to help them in developing their potential abilities to the fullest.

7. *Action and Reaction*.—As every action has its corresponding reaction, executives should see to it that their actions are such as to bring out desired reactions in their subordinates.

8. *Progress*.—Restrictions preventing subordinates from doing their best work should be determined, investigated, and removed to the extent possible.

9. *Over-all Viewpoint*.—Department and divisional ideals should give way to those covering the business as a whole, in order to insure a proper coordination of all the parts.

10. *Human Growth*.—Each executive in an organization should be made to see an ideal ahead of him that his mentality can comprehend, for, just as surely as he attains it, the way is paved for its replacement by a higher one.

11. *Financial Rewards*.—Executives should be rewarded on some basis which pays in proportion to the individual or collective effort given to secure results.

12. *Improvements*.—Constantly place new ideals and problems before subordinates for their individual and collective consideration, advice, and action, thus paving the way for constant improvement in results.

A MANAGEMENT "INDEX"

Barron's for Jan. 26, 1931, said:

There is an abundance of information to be had as to nearly all the relevant facts concerning most companies. Never was the financial world so competently served in this respect as it is today; never was the

MANAGEMENT AS THE KEYSTONE

discussion of financial facts and figures so expert and so thorough as it is nowadays.

Only one, but that is the most important, element escapes the net of this analysis, and this is "management." No way has yet been devised for subjecting this to an "index" basis of treatment, and none ever will be. Yet it is the key to everything else. The investor must inform himself of that as best he may. Management is mortal and subject to all the ills to which humanity is heir. And the unfortunate thing is that its failure—when it fails—reflects itself in the figures too late, as a rule, for the investor who relies upon the figures alone for his protection.

Somewhat in support of this editorial, let us quote from an advertisement in *Time*, for Apr. 29, 1929, by George H. Burr & Company, as follows: "There is a tangible factor which decides the intrinsic worth of securities, never itemized in balance sheets. This factor is the capacity of a company's management."

Here you have the conclusions of financial men as to the vital importance of management, both viewpoints being, however, that there is no real index covering this management factor, and that the "capacity" of management cannot be reflected in financial records.

If management is as important as we have been contending that it is, and if balance sheets and income statements constitute the final record of management results, then there must be something, somewhere, in these records which can be formed to make an "index" covering management's work and worth. If not, where will we look?

Assets in themselves constitute no index of management. What does count is the use management makes of the assets that are at its disposal.

Good-will is important and a measure of the value of management, but this can disappear in a day owing to revolutionary changes in products, or to obsolescence in management as well as in equipments. The maintenance of good-will is the important consideration.

Machines, processes, and buildings are merely tools which management uses. How management uses them is what counts.

PROFIT ENGINEERING

Merchandising plans and advertising programs may be comprehensive and result producing today, and out-of-date tomorrow. What management does in keeping in advance of the business procession, and in changing plans and programs in line with its observations, are what count.

An inventory may be usable at the moment and have to be sacrificed later. How management anticipates the changes is vitally important.

All will agree, however, that the *tangible net worth*, bringing together the values of capital stock and surplus (the surplus including the retained profit), is the best index of the strength of a business enterprise. It is the best gauge of the ownership equity. It is the best index of management's ability and conservatism. It is a real reflection of past success.

All will also agree that the *surplus net income* to the tangible net worth is the true index of management's capacity to take invested capital of the owners and make a proper return on it for them. It is the gauge of present results. Tangible net worth and net income bring past and present to a focus.

The product of the tangible net worth "content" (net worth divided by assets) and the percentage of surplus net income to the net worth is a factor with the common denominator of 1, thus making the resulting expression comparable as between years or businesses.

On this basis the General Motors and Inland Steel indexes, for the year 1931 (by moving the decimal point one place to the right), would be:

General Motors.....	96.075 ($87.82\% \times 10.94\%$)
Inland Steel.....	10.919 ($57.17\% \times 1.91\%$)

These are composite calculations covering both tangible net worth and surplus net income, as a management index. In this connection see studies on pages 73 and 74.

A WORD PAINTING OF THE IDEAL MANAGER

As a conclusion to this chapter, the author wishes to present a word painting of a flesh-and-blood example of

the ideal manager—David Lloyd-George, the former “general manager” of the British Empire.

A striking figure in British statesmanship before the World War, he became even more powerful during and after the war and achieved a place in world affairs which, through sheer force of ability and personality, seemed at the time likely to be his for years to come. He weathered the gales born of political strife and turmoil, and despite alliances against him, regardless of the nature of the problems confronting him, the little Welshman kept bobbing up, smiling and on top. Ministry after ministry resigned in other countries, with a change in administration in our own, but the leadership of Lloyd-George seemed so strong that there were indications that he would not be displaced for years to come, by any then prominent in British politics.

A study of the man's career, and of the statements made about him by enemy as well as friend, reveal the following as the points which made Lloyd-George the executive he was: *He organized and delegated; he supervised and watched progress; he took counsel wherever he could get it; he abhorred details and arranged for subordinates to handle them; he watched for opportunities and was quick to make the most of them; he compromised whenever necessary; he thought more of the British Empire than he did of Lloyd-George; he coordinated warring factions; he respected his opponents' strength; and he kept himself in readiness to jump into any situation, at any time, at any place.*

CHAPTER XXI

PROFIT ENGINEERING

What business men need today is the ability to think in terms of principles. Methods differ with businesses and change with conditions. But principles are unchanging and the man who understands the principles governing his business works with a speed and sureness that is otherwise impossible.—Alexander Hamilton Institute.

Profit engineering, under postcrash pressure, gives promise of attaining shortly to the dignity of a recognized profession. Thinking on the subject has crystallized rapidly in recent months. The idea of budgetary control is being carried to its logical conclusion. Profits are commonly thought of as what remains after expenses are deducted from revenue. This, says the profit engineer, is 100 per cent wrong. Profits should be the first deduction made. They are capital's wages. For them business exists. Provide first for profits. Make the business live on what is left.

Planned profits are as possible as planned production.—From *The Business Week*, May 28, 1930.

We now come to the end of this mental journey which we have taken together as reader and author; to an attempt to summarize and bring to a focus what has been presented herein; to an effort to set forth what is necessary to do to translate philosophy and technique into the kind of action which can mean greater profits for the one who is interested in the subject. In doing this the author wishes to set forth three recitals of actual situations observed in the course of a busy professional life, with the names of the executives purposely changed so as not to reveal identities. These recitals have a real bearing on this vital matter of profit making, as will be seen after they have been presented.

PLANNING

Sellers was the president of an internationally known concern. His rise had been meteoric and romantic. He had

visions that his business would in time be a second United States Steel Corporation, and he was working slowly but surely toward this goal—so he thought. It looked as if he had the inside track in his race with his competitors, as his progress was consistent and was “viewed with alarm” by these competitors.

Sellers had surrounded himself with high-priced aids on all phases of business activity. Everything in the way of improvements that money could buy was furnished these subordinates. Staff advice was a part of the business program. Educational work of a high order was a factor in developing a trained organization.

But Sellers did not know what *not* to do. He hit an “open switch” right after the conclusion of the World War, while going ahead at full speed through the storms and stresses of that time. When they picked him out of the wreckage, he found himself being advised by bankers, creditors, and stockholders—no, not advised, *commanded*—with regard to what to do and when. Needless to say, he did what he was told to do, and today this business is going ahead again at a good clip.

The mistake Sellers made—and the Sellers’s are legion in business—was that he failed properly to look ahead and plan the steps he should take. We all look ahead and plan somewhat, but we do not all look ahead carefully, logically, and scientifically, as does the Weather Bureau, the astronomer, the insurance actuary. Sellers was in the first class, and he and the others (particularly the others) paid for it with nearly all they had.

There was no controllership, the treasurer being both corporate officer and managerial director of finance. There was no budget in the sense of the scientific budget of today. Purchases could be made for large amounts, and the first notification the treasurer would have of the transactions would be the invoices for goods, mostly at times when he, not knowing of such commitments, had not provided himself with funds for such inroads on his bank account. The head directing the sales and the one in charge of manu-

facturing were as far apart as the poles, the organization of each, as to type, being built around individual whims and preferences. Even the chart of organization of the one was entirely different from that of the other. Costs did not tie in with the general accounting. The estimates for future demands for the products were from 50 to 100 per cent higher than what competitors were thinking of. Materials were purchased and buildings erected with these demand estimates in mind, and when the smash came the bulk of the assets were solidly "frozen." Only fast footwork by bankers and creditors forestalled the appointment of a receiver.

Sellers didn't know, or didn't believe if he had heard, that scientific financial forecasting, budgeting six months to a year and five years ahead, plus current budget control of a graphic nature (Profitgraph), would have forced him materially to reduce his speed and continue ahead slowly until the signals set against him were replaced by the "resume at full speed" signaling. Sellers didn't know that success in business is as much dependent upon ability to prophesy as upon success as a producer; he didn't know that external conditions exert a more potent influence on profits than internal conditions. *Sellers didn't plan.*

ORGANIZATION

Anderson was the treasurer of a well-known company and had for years been observing and appraising the mistakes of Loftus, the general manager. Being the financial man, he knew what these mistakes were costing his company, but he was powerless to do anything about the matter. He resolved, however, that, if he ever became chief executive, he would do many things in a way entirely opposite to that followed by Loftus.

Loftus did not believe in delegating any responsibility or authority to anyone and attempted to carry the inefficiencies of his twenty-odd subordinates on his own two shoulders, by deciding for them as to practically every

point of any importance. The author has seen him sign requisitions for pencils and for repairing a shop clock. He looked over all letters written by his subordinates each day before they were mailed. He called this "keeping up with the procession."

All plans had to be submitted to him so that he could familiarize himself with the details, which, of course, he couldn't begin to do. Endless conferences were the order of things. He said this was his way of "finding out what was going on." Incidentally, the company in question had lost 2 per cent on its capital for several years.

Loftus died in his forties, owing to excessively high blood pressure, so the doctors said, but the author's own diagnosis indicated that he succumbed to a condition induced by his self-imposed task of attempting to do the headwork for all of his subordinates. He died a martyr to the cause of making up, or trying to make up, for the deficiencies in others.

Anderson took hold as general manager. He reviewed the past of his company and then appraised the future as best he could. He organized, delegated, and supervised. He appointed divisional heads, outlined to them their responsibilities, and gave them the required authority to get results. He also gave them the necessary tools and money allowances to work with. He landed swift and hard when results were unsatisfactory and rewarded liberally when they were gratifying. He paid no more attention to details than was absolutely necessary.

For eight years subsequent to the death of Loftus, the 2 per cent loss on capital became a 12 per cent profit yearly, and additions were made to the plant from time to time until it was twice the size it had formerly been, which meant further increases in profits due to the expansion.

Where Loftus had developed "leaners," Anderson developed "leaders." The one fostered uncertainty, indecision, and timidity, while the other induced certainty, force, and courage. The one was a "one-man band," while the other organized an orchestra.

PROFIT ENGINEERING

There are hundreds of men like Loftus and Anderson in business, and the sad part of it is that the men who work like Loftus end up on the human scrap pile before the prime of life, with their concerns only ordinary successes. The Andersons play golf, have desks that are clear, and can spend an hour or so each day in communing with the "inner man" on plans, progress, futures, and the like. *And the Andersons pay dividends.*

CONTROL

Doyle was the president of one of the largest institutions in the country, succeeding a man who was more interested in stock markets than in sales markets. The products of the company were in such demand that they could be sold at almost any price. The result was that this business ship was sailing along in fair weather, with nothing on the business horizon to indicate the nearness of economic storms.

Suddenly—and without warning—the economic squalls of 1920 hit this business and caught its officers totally unprepared, and, before control of the big ship could be obtained, it was necessary to borrow large sums of money.

Doyle's position thereafter was that something should be done to secure an adequate control of the operations of the business ship, so that the stockholders would have something left for them out of every sales dollar. He reasoned that there must be plans made with reference to the future, that organization should provide for a high order of administration as well as executive direction, and that means of control should be developed, so that the personnel with proper plans could project itself as much as possible into the future and discount changing trends and tendencies.

Furthermore, Doyle laid down the principle that he and his subordinates should be prepared at all times to alter the course of the business ship promptly and effectively should circumstances develop which made it necessary to do so. Not content with this advanced theory of management, Doyle went further and stipulated that there must be the kind of control which would work regardless of what

PROFIT ENGINEERING

the future might bring forth, no matter what changes might take place, and irrespective of how suddenly they might take place.

Doyle insisted that human ingenuity and skill (engineering) and scientific management must reduce the adverse effects of economic gales to the very minimum.

His company weathered the stress of 1920, 1921, and 1922, became unusually large and successful during the years 1923 to 1929, and made net profits for the common stockholders for the years 1930-1931-1932.

PRINCIPLES OF PROFIT ENGINEERING

The reason for these word paintings of real business situations is that they bring out most forcibly what the author conceives to be the principles of profit engineering, as:

1. The principle of planning.
2. The principle of organization.
3. The principle of control.

These, when brought together in proper balance, spell but one thing—*profit assurance*.

THE LAWS OF PROFIT MAKING

If one obeys the laws of nature and of his country, he remains healthy and stays out of jail. Likewise, if a firm does not violate the laws of profit making (if such laws can be enunciated), there is then no good reason why profits should not be both adequate and regular.

Here, then, is a set of laws, as they occur to the author, which can be considered and discussed by the executives of given concerns:

1. Profit should be the *first* deduction from income, and the business budgeted to "live within the balance."
2. Profit should range from 12 to 18 per cent yearly, as surplus net income to the tangible net worth, with 15 per cent as the mean requirement, as an average over a period of years.

PROFIT ENGINEERING

3. Profit beyond 6 per cent on the capital investment (tangible net worth) is the true business profit, as up to 6 per cent it is the return for money as money.

4. Profit in sales is only *relative* and can be a *variable*; on capital employed (net assets), it should be *absolute*, a *constant*. Turnover of capital should govern the rate of profit in sales.

5. The true profit gauge is not the given year, but the cyclical swing, ranging from three to five years.

6. The single profit or loss figure, at the end of a month or year, is but the "average" of the contributions thereto by the various factors in the business, which contributions should be known, both plus and minus.

7. Profit should be related to labor and overheads in making price, and not to total cost, as these are the gauges of "relative complexity" in manufacture of products. Material in itself is not the important thing—*what is done to it as called for by specifications should determine what the profit for work done and its facilitation should be.*

8. Actual profit should be measured against a predetermined standard, and the ratio of profit efficiency determined.

9. Profit is not something that is "left over" after everything else is provided for. Being an economic necessity, as necessary as power for the machines, it should be planned and controlled, or "engineered."

10. Profits are made by the combined efforts of everyone in a business, whose activities should be properly organized and directed, as no single employee can be said not to influence the final result.

These can be called the Ten Commandments of profit making. If lived up to there can be adequate and regular profits.

THE COST OF PROFIT ENGINEERING

We usually consider cost in terms of money, and the natural question will be, What will it cost to put a business on a profit engineering basis? From the standpoint of dollars and cents involved the cost will merely be an advance against the additional profits which will later flow from the work done; an investment akin to that in a new and revolutionary machine which will return its first cost almost from the start.

There is, however, another kind of a cost, and a cost that is harder to pay, so much harder in fact that most executives are likely to read this text and then "pass by on the other

side." The few who read and do will reap real rewards. It is unfortunately true that we have more men in business like Sellers and Loftus than like Anderson and Doyle; otherwise our profit record would not be the disgrace that it is. This greater cost is not a money cost. It is a cost which can be set forth in the form of these requirements:

1. *Vision* to conceive what the possibilities in profit engineering would mean to a given business.
2. *Will* to initiate the first step—a change in the thinking, and a reversal of the usual approach to the problem of profit making.
3. *Willingness* to work hard enough to do the things necessary to secure the results.
4. *Patience* to put up with the shortcomings of subordinates until they see the import of "engineered profits," after which they will cooperate in an earnest endeavor to make the work successful.
5. *Courage* to go through to the end regardless of the obstacles, irritations, and the stumbling which always accompany the introduction of something seemingly so radical.

This latter fivefold price is the real price to pay for securing regular and adequate profits in a business.

PITFALLS OF PROFIT ENGINEERING

1. *Making the Profitgraph.*—Profit engineering is not a technique which, through the mere use of slide rule and chart paper, will mean a Profitgraph which will add extra dollars and cents to the Surplus Account on the balance sheet. The Profitgraph is a tool; that is all that is claimed for it. Even as a tool, however, it must be used by men who understand its effective operation.

Do not think, therefore, that a few lines hurriedly drawn on a piece of chart paper, after a hasty review of facts, constitute your Profitgraph. It is not so simple as that. If the actual and budgeted Profitgraphs are not developed so that they are coordinate with actual and budgeted income statements as conventionally compiled, do not make them. They will not only be inaccurate and misleading—they will be downright *dangerous* to use.

Slight inaccuracies in sales-volume or fixed-cost or variable-cost calculations will exert a pronounced influence

on the profitless point and the width of the profit area. The *crossover* of sales and cost lines, as to "angle" and "place," is as sensitive as a compass needle. A few hours or a few days spent in making a Profitgraph, unless the preparatory work has been both well thought out and properly done (and this will take several weeks or months), will do more harm than good.

Keep in mind that the Profitgraph is merely the plan on chart paper of scientific budgeting—*variable budgeting*—and if this is well done the Profitgraph will take care of itself.

2. *The Need for Executive Support.*—Equally disastrous as inaccurate "profitgraphing" is the delegating of this important work to a subordinate who is without authority and lacks the complete support of the chief executive. To many subordinate executives this modern approach to profit making will be new and seemingly radical, and the usual retreat in such cases is "it can't be done." There will be many reasons why "it won't work here." Orations on "our business is different" will be many. Profit engineering under such conditions has the same chance as the proverbial snowball in the realm of his Satanic Majesty.

The prime requirement is the active and sympathetic support of the chief executive, and, unless he wants it himself and then sells the idea to his board of directors on its value from the standpoint of the stockholders' pocketbook, so that the power of the administrative machinery can be put behind the work, the best advice possible is to save the money that would otherwise be spent for this subordinate's time and, incidentally, help him to avoid scoring an inevitable failure against his record.

3. *The Over-all Viewpoint.*—Unless treasurer, sales manager, and production manager fully cooperate to help the controller in this great work—and it should be the controller's work—the results will *not* be forthcoming. Profit engineering is essentially a "business-as-a-whole" undertaking. It cannot be applied to any detached function alone, when such function directly influences the work and results

of other functions. Sales, production, and financial functions are certainly related functions and should be treated as a unit in profit engineering.

4. *The Importance of Sales.*—Perhaps the most important requirement in this important development is the close harmony necessary between the sales manager and the controller. Profit engineering can succeed only when there is efficient sales planning to determine the sales income that is probable, because there can be no profits if there are no sales. Financial control and sales control must mesh. Without the controller the sales manager can of course get sales—but they may be unprofitable sales. Without the sales manager the controller can make an elaborate and accurate profit forecast and a correct Profitgraph—but the sales that are made may not be sufficient to bring in the necessary profits.

Sales manager and controller must cooperate if maximum results are to be secured. One can sing base, and the other tenor, but the notes must harmonize. And this is not a difficult task if each goes at the work in the “right spirit.”

5. *Organizing for Profit Engineering.*—A work as important as profit engineering should be as carefully organized as that of organizing a major advertising campaign, or a production control or inspection function in the plant. If this is not done, the effort will go the way of all other unorganized attempts—first disintegration and then ultimate failure. Organization will be the insurance against failure.

The work of profit engineering should be built into a division of the Controller's Department. If there is no controller, a controllership should be established before profit engineering is seriously considered.

6. *Importance of Background.*—A current month or year-to-date showing does not reflect sufficient background to justify the planning of a major profit engineering campaign. Rise and fall in various items, averages, trends, projections, and the like, should be developed from sufficient previous data to result in sound conclusions. It would be well to consider 1930–1931–1932 as a depression cycle; the years

1927-1928-1929 as a prosperity cycle; and both cycles as a major swing. A moving five- to ten-year picture would be illuminating.

These should be used, however, merely as guides. Present conditions and probable future happenings are what should govern profit plans, these to be made, however, in light of past history.

7. *Necessity of Strong Foundation.*—Possibly the most important work in profit engineering is the proper analysis of fixed and variable items of the outgo dollar, particularly that part of the fixed costs which we have referred to as the “nucleus” fixed costs. This work should be thoroughly done and then charted, as it all constitutes the basis for variable budgeting and flexible cost control. The making of “guesstimates” should be entirely avoided.

8. *Flexible Cost Control.*—Variable costs will not automatically decrease when there is a drop in volume, nor will they increase themselves when volume rises. This must be done by management based on plans previously made, along with the knowledge of what is involved in changes covering volume increases and decreases. This should all be a matter of record, with the routine in the hands of the controller.

Within certain limits, costs can be decreased and increased with volume decrease and increase, and there can be flexible cost control if there is the right kind of predeterminations, and management does its part.

9. *Getting the Personnel to Help.*—Do not ignore the tremendous potential in the harnessed thinking power of an entire personnel in helping to contribute the gains that are necessary to give you the difference between actual and required profits.

Keep in mind that profit planning is but one step in profit engineering. Profit control is another and will indicate the relation of results to anticipations, as well as the nature of the steps to take to secure the results planned on.

But the most important step of all is to get your entire working population to begin “thinking with you” in actually doing what is necessary to make adequate and

PROFIT ENGINEERING

regular profits. Make this entire personnel your "staff organization."

10. *Counsel*.—At the risk of being personally misunderstood, the author suggests to executives who are thinking favorably of this philosophy and technique of profit engineering that they refrain from ignoring the help of competent men and firms in the professional ranks, who have had the necessary experience in sales, production, finance and management, or other lines, really to help executives make a better job of "engineering profits" than would be the case without their aid. Competent and unbiased business counsel can be as helpful as banker and lawyer.

THE NEED FOR PROFIT ENGINEERING

That American industry needs profit engineering is evidenced by the fact that, even in prosperous times, our profit record is far from being all that could be desired.

The 1929 results will indicate the road which must be traveled before we can materially better our profit situation. From the income tax returns of 89,896 concerns for that year, the average net income in sales was but 6.01 per cent. Nearly 40 per cent of the concerns showed deficits aggregating \$745,398,096.

THE PROMISE OF PROFIT ENGINEERING

In case after case coming under the author's notice, it has been found that when the effort to plan and control profit making was a sincere one, the result has been to improve the profit position: to net more than would have been the case had it not been for this newer and better approach. As one of many evidences of this, the following excerpt from a letter is submitted:

There is considerable personal satisfaction in having by practical demonstration proved that profit planning . . . can actually be carried out at least in so far as there is the will to really see it through. Group bonus, standard costs, budgets for expense, territorial sales quotas and an incentive plan for salesmen have resulted in a very much better than

PROFIT ENGINEERING

expected return. I have completed the plan right through to the P and L statement and the profitgraph. There is absolutely no question as to where the business stands and why. The means of control are there but they must be used.

There is sufficient evidence to prove that profit engineering is something that promises much for the future of American industry, and that it will accomplish more and more as time passes and its technique is better understood and more intelligently used.

SERVING A COMMUNITY OF INTERESTS THROUGH PROFIT ENGINEERING

Profit engineering, as it has been expounded in these pages, clearly recognizes that there are definite parties in interest in our complex business civilization, that each of these parties has definite and defensible needs, that these needs are not really in conflict, and that the proper and right use of the technique urged herein by business firms and trade associations constitutes the only common ground on which these parties can work and attain their goals. These parties and needs are

1. *Capital (Owners)*.
 - A. Adequate and regular return on investment.
 - B. Safety and security of investment.
 - C. Assurance of perpetuation of business.
2. *Labor (Workers)*.
 - A. Adequate and regular wages.
 - B. Reasonable hours of work.
 - C. Proper working conditions.
3. *Management (Executives)*.
 - A. Adequate and regular profits.
 - B. Uniformity of plant operations.
 - C. Maximum effectiveness of man-hour and material-dollar.
4. *Public (Customers)*.
 - A. Low prices
 - B. High quality
 - C. Long life

} as to products.

PROFIT ENGINEERING

Profit engineering is the answer to the problems of capital, labor, management, and the public.

PROFIT BIBLIOGRAPHY

To aid readers of this text to pursue the study of this vital subject of profits in its various aspects, the following works are suggested as being worth careful analysis:

- "Profits in Advance," Bristol (Harpers).
- "Pricing for Profit," Churchill (Macmillan).
- "Assuring Business Profits," Rand (Forbes).
- "Successful Control of Profits," Rautenstrauch (Forbes).
- "New Way to Net Profits," Shibley (Harpers).
- "Corporation Profits," Sloan (Harpers).

PROFIT ENGINEERING AS A PROFESSION

It is doubtful if there is a greater work before management than that of the "engineering of profits." We have engineering of power, of sales, of costs, of production, of plant, of product, and of other things. What is more logical, therefore, than profit engineering covering a business as a whole, particularly if we look upon the phrase as meaning human *ingenuity* in concept and *skill* in execution, as applied to the important task of making business more profitable.

As regards the field for the abilities of men who are competent to aid in this great work, it can be said that it is really virgin in character, abounding in opportunities and rich in possible rewards. As one man said about the possibilities, "One who can secure results can just about 'write his own ticket.'"

The greatest opportunities at the moment are before the controllers of our plants; to men who have the capacity and the urge to become controllers later on; and then to the men who can take over the work of divisions, under the controllers, who will be placed in charge of this profit-planning and control development. These will be our "profit engineers."

PROFIT ENGINEERING

PROFIT ENGINEERING

We therefore offer to the industrial world, as well as to the world of finance, this humble effort to help “blaze the trail” to better business—better because more profitable—for, in the last analysis, there can be no progress unless it comes out of profits. Profit engineering then, is the forerunner of greater progress in American industry and finance.

INDEX

A

- Ability of men to create, 285
- Absorption of fixed costs, 170
- Accounting covering variances, 163
- Actual results, in Profitgraph form, 145
 - projected on yearly basis, 143
- Administrative expenses, apportioning to selling and manufacturing, 199
- Advertising, 251
- Alexander Hamilton Institute, 302
- Alford, L. P., 267
- Allowable costs, determining, 132
- Allowable fixed costs, formula for determining, 133
- Allowable variable costs, determining, 133
- Anderson and Loftus, case of, in organization, 304
- Apportioning administrative expenses to selling and manufacturing, 199
- Appraising present results, 116
- Arch of the controllership, 275
- Ayres, Leonard, 112, 200

B

- Babson, Roger W., 231
- Balance sheet, graphic presentation, 183
 - relations, 182
 - Turnovergraph as graphic variable, 187
- Barron's*, 25
- Betterment program, determining from Profitgraph, 121
- Betterment staff, cost of, 263
 - functions of, 262
 - head, specifications of, 263
- Betterments in income statements, 45

- Bliss, James H., 67, 68, 72, 180
- Borrowed money, interest on, 75
- Bristol, Lee H., 194
- Brown, Donaldson, 8, 259
- Budget, developing variable, 143
 - economic point, 108
 - meaning of, 115
- Budget point on Profitgraph, 90
- Budget record, for variable budgeting, 144
- Budgeting, definition of, 115
 - general aspects of, 112
 - fallacy of fixed, 97
 - variable, 91, 97, 99, 107, 121, 139, 143, 167
 - frontispiece showing final picture of, 145
- Burroughs quota system, 242
- Business, as all distribution, 7
 - evolution of, 1
 - examination and medical examination, analogy between, 180
 - gauges of, 28
 - as income and outgo, 10
 - man as source and cause of, 280
 - military, and human-body organizations in parallel, 256
 - organization, elements in, 261
 - profit necessary, theorem XX, 225

C

- Calendar, thirteen period, 207
- Capacity, possible versus employed, 90
- Capital, employed turnover, 71, 129, 185
 - needs of, 341
 - "wages" of, 8
- Charted sales comparisons, 178
- Chief executive, duties of, 295
- Color scheme, profit and loss on Profitgraph, 94

PROFIT ENGINEERING

- Community of interests served by profit engineering, 314
- Competence in management, 294
- Complete financial analysis, 191
- Complexity of work, profits in proportion to, 196
- Consumer, fundamentals affecting, 235
 - importance of, 233
- Consumption, motive, 7
 - production and, 232
- Contests, sales, 248
- Contingent liabilities, 48
- Control, case of Doyle, 306
 - as engineering, 273
 - exception principle in, 274
 - financial, 268
 - as management's coordination function, 274
 - meaning of, 272
 - planning in, 274
 - of profits, lack of, 22
 - relating actuals to predeterminations in, 273
 - of sales, by point system, 248
 - of uncontrollables, 147
- Controller's department, work of, 275
- Controller's scope of work, 277
- Controller's work, keystone in, 268
- Controllershship, arch of, 275
- Controlling and planning profits, 11
- Converting surplus profit to operating profit, 77
- Cooperation of subordinates, securing, 297
- Coordinating staff and line, 263
- Coordination, and counsel as staff organization, 257
 - in General Motors, 259
- Cost, of betterment staff, 263
 - depreciation as direct, 198
 - of profit engineering, 308
 - possible reduction of, determination of, 148
 - predetermination of, machinery of, 137
- Cost line, as chords of arcs, 141, 226
 - at different angles, 160
- Cost target, 132
- Costing, of sales, 176
- Costs, absorption of fixed, 170
 - standardized operation, 138
 - study of unit, 141
 - three kinds of, 85
- Counsel, and coordination as staff organization, 257
 - in General Motors, 260
- Crisis point, 94
 - sales necessary to meet, theorem XIV, 222
- Cyclical normal sales capacity, 88
- Cyclical versus yearly swings, 200
- D
- Danger point, 94
 - sales necessary to meet, theorem XV, 223
- Deadline, on Profitgraph, 91
 - sales necessary to meet, theorem XIX, 225
- Decision book, sales, 246
- Definitions of various profits, 62
- Deflation of fixed assets, 205
- Dependent sequence, law of, as applied to sales, 240
- Depreciation, 150, 201
 - as a direct cost, 198
 - handling of, 38
- Determination of allowable costs, 132
 - of allowable variable costs, 133
 - of betterment program from Profitgraph, 121
 - of cost reduction possibilities, 148
 - of profit or loss, formula for, 107
 - of required profits for use in profit-graphing, 123
 - of required sales volume, 125
- Development of sales organization efficiency, 244
 - of variable budget, 143
- Diagnosing the Profitgraph, 119
- Distribution, changes in, 233
 - as constituting business, 7
- Divisions, of outgo dollar, 10
 - of profit area on Profitgraph, 98
- Dollar, sales, analysis of, 105

INDEX

Dollar targets, 61
Douglas, W. O., 36
Doyle, case of, in control, 306
Dunn, Horace C., 51
duPont, Coleman T., 11

E

Earning requirements on Profitgraph, 92
Economic approach in determining sales par, 127
Economic budget point, 108
Economic factors in profit making, importance of, 194
Economic research, 208
Edison, Thomas A., 280
Efficiency, development of sales organization, 244
Eight sales fallacies, 237
Elements in business organization, 261
 in controller's work, 277
 in outgo, 59
 in securing income from sales, 60
Elimination of waste, 154
Emerson, Harrington, 137, 257, 271
Engineering, in control, 273
 profit, 12
Equation, fundamental, behind Profitgraph, 212
Evolution of business, 1, 12
Exception principle in control, 274

F

Factors in financial records, 29
 in profit control, 178
Facts, need in profit control, 179
Factual background in making Profitgraph, 122
Fair return, rate of, 70
Fallacies in selling, eight, 237
Fallacy, of fixed budgeting, 97
 sales volume, 18, 100
Final picture of variable budgeting, Frontispiece
Financial analysis, suggested sequence in, 189
 suggestions in starting, 192

Financial control, 268
Financial factors, analyzed on ratio basis, 184
Financial losses, 166
Financial records, as business gauges, 28
 factors in, 29
 failure to provide adequate, 24
 as genesis of profit engineering, 46
 management's relation to, 35
 meaning of, 36
 parties' interest in, 29
Fixed asset deflation, 205
Fixed asset values and "real" dollars, 197
Fixed budgeting, fallacy of, 97
Fixed costs, absorption, 170
 allowable, theorem X, 219
 formula for determining, 133
 making them flexible, 155
Fixed costs, maximum, theorem VIII, 218
 theorem XII, 220
 and profits, 86, 102
 transfer of, to variable costs, 156
Flexible fixed costs, 155
Forecast of profits, preliminary, 121
Formula, covering profits, 69
 for determining allowable fixed costs, 133
 for determining operating profits, 124
 for determining profit or loss, 107
 for determining profitless point, 87
 for determining sales needed, 107
Formulas, changes necessary in sales and profits, 115
Frank, Dr. Glenn, 270
Functions, of betterment staff, 262
 of organization, of major nature, 254
 of treasurer, 276
Fundamental equation behind Profitgraph, 212
Fundamentals affecting consumer, 235

G

General Motors, coordination in, 259
 counsel in, 260

PROFIT ENGINEERING

General Motors, profit formula applied to, 73
 romance of, 54
 Genesis of profit engineering, financial records as, 46
 of Profitgraph, 82
 Gilbreth, Frank B., 27
 Goldman, Emma, 27
 Grant, W. T., 147
 Graphic balance sheet, 184
 Graphic income statement, 183
 Graphic variable balance sheet, Turn-overgraph as, 187
 Graphic income statement, known as Profitgraph, Frontispiece
 Graphics, meaning of, 50
 in profit making, 50
 uses of, 47
 Gray, Kingsley, 208
 Grayson, David, 280
 Greater profit with less volume, 104

H

Hadden, A. A., 204
 Harrison, G. Charter, 35, 271
 Head of betterment staff, specifications of, 263
 Hess, Henry, 82
 Hoover Committee on Elimination of Waste in Industry, 280
 Hopf, Harry Arthur, 291
 Hovey, Floyd F., 99
 Human-body, business, and military organizations in parallel, 256
 Human development, staff organization in, 287

I

Idea Department, 289
 Ideal income statement, Profitgraph as, 109
 Ideal manager, word painting of, 300
 Idleness, 152
 Ignorance of actual and potential markets, 19
 Incentives, mathematics covering management, 227

Incentives, plan for management, 157
 Income, and outgo, 59
 from sales, elements in securing, 60
 Income statement, graphic variable, known as Profitgraph, Frontispiece
 Profitgraph as ideal, 109
 relations, 183
 Income statements, betterments in, 45
 Index of management, 298
Industrial Executive, 161
 Inefficiency of labor, 166
 Information in warfare, 53
 Initiative in management, 295
 Inland Steel, profit formula applied to, 74
 Interest on borrowed money, 75
 on investment, 75, 91
 Inventory, 40

K

Kettering, Charles F., 235
 Key to mathematical symbols, 212
 Keyser, Cassius J., 210
 Keyserling, Count Hermann, 263
 Keystone in controller's work, 263
 in profit making in management, 291

L

Labor, inefficiency of, 166
 needs of, 314
 Langstroth, Lorenzo Lorraine, 286
 La Rose, E. S., 96, 109, 128
 Law of dependent sequence applied to sales, 240
 Lawrence, Joseph Stagg, 14
 Laws of management, 297
 of organization, 265
 of profit making, 307
 profit margin and turnover, 72
 Liabilities, contingent, 43
 Line and staff, coordinating, 263
 Lloyd-George, David, 301
 Lough, William H., 234

INDEX

Losses, financial, 166
 manufacturing capacity, 165
 material, 166
 price, 164
 purchasing, 164
 quality, 166
 selling capacity, 166

M

Machinery of cost predeterminations, 137
 Maintenance, 153
 Making fixed costs flexible, 155
 Making the market survey, 238
 Man, as source and cause of business, 280
 how mind works, 282
 Management, as career, 295
 competence in, 294
 coordination function of, 274
 incentives, mathematics covering, 227
 plan of, 157
 index of, 298
 keystone in profit making, 291
 laws of, 297
 measuring profit result of, 66
 needs of, 314
 place of initiative in, 295
 place of, in profit making, 77
 relation of, to financial records, 35
 responsibilities of, 292
 for profit making, 26
 Manager, ideal, 300
 Manual, sales, 246
 Manufacturing capacity losses, 165
 Margin law, 72
 Marginitis, 14
 Market research, 234
 Market survey, making, 238
 Markets, ignorance of actual and potential, 19
 Massey, R. V., 289
 Master control, 279
 Material losses, 166
 Mathematical approach in determining sales par, 126
 Mathematical symbols, key to, 212

Mathematics covering management incentives, 227
 covering standard costs at normal capacity, 228
 Measuring management's profit result, 66
 Men, ability of, to create, 285
 analysis of pivotal, 296
 and money, synchronizing, 263
 no duplicates among, 284
 Merchandising, neglect to consider, 20
 Mikimoto, K., 6
 Military, business, and human-body organizations in parallel, 256
 Model, for organization, 254
 Money and men, synchronizing, 263
 Moore, W. Clement, 202

N

Nash, story of, 192
 Net worth, 41, 68
 rate of surplus profit to, 69
 tangible, 191
 "Net worth content," 69
 Normal capacity, cyclical, 88
 mathematics to determine standard costs at, 228
 pricing on basis of, 195
 profitless point, theorem III, 215

O

Objective in warfare, 52
 Obsolescence, 204
 One hundred per cent as base in variable budgeting, 139
 Operating profit, formula for determining, 124
 Operation costs, standardized, 138
 Organization, case of Anderson and Loftus in, 304
 elements in business, 261
 importance of, in profit making, 253
 laws of, 265
 major functions in, 254
 and profit making, 266
 for staff, 288
 Organization model, 254

PROFIT ENGINEERING

Outgo, elements in, 59
and income, 59
Outgo dollar, divisions of, 10
Owner's profit yardstick, 67

P

Parties interested in financial records, 29
Past and present, 44
Patterson, John H., 231
Perry, Thomas D., 146
Pitfalls of profit engineering, 309
Pivotal men, analysis of, 296
Pivotal point, 103
Plan of management incentives, 157
Planning, case of Sellers, 302
and controlling profit making, 11
in warfare, 53
in work of controller, 274
Plotting the profit course, 63
Point system of sales control, 248
Porter, David B., 47
Possibilities of cost reduction, determination of, 148
Practical capacity covering sales, 87
Predetermination of costs, machinery of, 137
Preliminary profit forecast, 121
Premise of profit planning, 56
Present results, appraising, 116
Price factor, 9
Price losses, 164
Pricing on basis of normal capacity, 195
Principle underlying fair profit return, 70
underlying Profitgraph, 85
Principles of profit engineering, 307
Product lines, profit and loss according to, 174
Production must fit consumption, 232
Production planning and profit planning, analogy between, 58
Profession of profit engineering, 315
Profit, anemia, reasons for, 15
area on Profitgraph, divisions of, 98

Profit, bibliography, 315
in dollars, theorem VI, 217
greater with less volume, 104
and loss, color scheme on Profitgraph, 94
due to purchasing, 41
neglect to study into sources of, 21
by product lines, 174
in per cent, theorem VII, 217
reasons for, 3
and sales course, variations from, 167
and sales formulas, changes necessary in, 115
as service charge, 4
unitary formula covering, 76
as "wages," 8
Profit control, lack of efficient, 22
list of factors to consider in, 178
Profit course, plotting of, 63
Profit department, 12
Profit efficiency, 71
Profit engineer, 13
Profit engineering, 12
community of interests in, 314
cost of, 308
financial records as genesis of, 46
as forerunner of progress, 316
need for, 313
pitfalls of, 309
principles of, 307
as a profession, 315
promise of, 313
Profit forecast, of preliminary nature, 121
Profit formula, 69
applied to General Motors, 73
applied to Inland Steel, 74
Profit laws, 72
and organization, 266
Profit making, failure to organize for, 23
importance of economic factors in, 194
of organization in, 253
lack of standard practice in, 15
laws of, 307
management as keystone in, 291

INDEX

- Profit making, management's place
in, 77
management's responsibility for, 26
planning and controlling, 11
two ways of, 112
use of graphics in, 50
- Profit par, necessary, 65
- Profit planning, premise of, 56
and production planning, analogy
between, 58
- Profit policy, 8
- Profit record for 1927, 14
for 1929 to 1931, 14
- Profit result, measuring management's,
66
- Profit return, principle underlying, 70
- Profit yardstick, covering owner's
equity, 67
- Profitable service, 3
- Profitgraph, budget point on, 90
cost line as chords of arcs, 141, 226
deadline on, 91
determining betterment program
from, 121
diagnosing the showing of actual
results, 119
divisions of profit area, 93
earning requirements on, 92
factual background to consider in
making, 122
first, by author, 83
fundamental equation behind, 212
genesis of, 82
as ideal income statement, 109
as management tool, 96
other points on, 93
principle underlying, 85
profit and loss color scheme, 94
progressive steps in making, 119
purpose of, 80
sales goals determined for, 129
scales for, 82
as variable income statement, 82
vital statistics on, 94
what it is, 81
what it really becomes, 110
- Profitgraphing actual results, 145
- Profitless point, formula to determine,
87
- Profitless point, in dollars, theorem
I, 214
in per cent, theorem II, 214
normal capacity basis, theorem
IV, 215
- "Profitmeter," 170
- Profits, bibliography, 315
defined, 62
failure to plan for in advance, 17
and fixed costs, 86, 102
how secured, 5
in proportion to complexity of work,
196
relation of supervisors and workers
to, 149
what they are, 5
who makes them, 6
who pays them, 6
- Progress and profit engineering, 316
- Projecting actual results on yearly
basis, 143
- Promises of profit engineering, 313
- Public, needs of, 314
- Purchasing losses, 164
- Purchasing profit and loss, 41
- Q
- Quality losses, 166
- Quota, sales, 241
- Quota system, Burroughs Adding
Machine Company, 242
- R
- Rand, James H., 200
- Rate of fair return, 70
- Ratio analysis of financial factors, 184
- "Real" dollars and fixed asset values,
197
- Receivables, 40
- Record covering the variable budget,
144
- Rejections, 153
- Relating actuals to predeterminations
in control, 273
- Relation of management to financial
records, 35

PROFIT ENGINEERING

Relation of supervisors and workers to profits, 149
Rent, 152
Required profitless point, theorem IX, 219
Required profits, determining in making Profitgraph, 123
Required sales volume, determining in making Profitgraph, 125
Research, 283
 economic, 208
 market, 234
Reserves, 40
Responsibilities of management, 292
 for profit making, 26
Ripley's "Main Street and Wall Street," 36
Rockne, Knute, 111, 179
Romance of General Motors, 54

S

Sales, Burroughs quota system, 242
 determining required volume, 125
 elements in securing income from, 60
 law of dependent sequence applied to, 240
 necessary, formula for determining, 107
 theorem V, 216
 theorem XI, 220
 to meet Crisis Point, theorem XIV, 222
 to meet Danger Point, theorem XV, 223
 to meet Deadline, theorem XIX, 225
 to meet Surplus Profit, theorem XVIII, 225
 to meet Surplus Retention Point, theorem XVII, 224
 to meet Unhealthy Point, theorem XVI, 223
 and profit course, variations from, 167
 and profit formulas, change necessary in, 115
 100 per cent practical capacity, 87
 securing by watching fixed cost absorption, 173
 Sales, statistical work, 176
 Sales capacity, cyclical normal, 88
 Sales comparisons charted, 178
 Sales contests, 248
 Sales control, point system of, 248
 Sales costing, 176
 Sales decision book, 246
 Sales department, task of, 241
 Sales dollar, analysis, 105
 Sales fallacies, the eight, 237
 major variable components of, 106
 Sales goals, determined upon for Profitgraph, 129
 Sales manual, 246
 Sales organization efficiency, development of, 244
 Sales par, economic approach in determining, 127
 mathematical approach in determining, 126
 scientific approach in determining, 127
 unscientific approach in determining, 126
 Sales quota, 241
 Sales volume fallacy, 18, 100
 Salesmen, selection of, 245
 Sample sales dollar analysis, 105
 Scales of Profitgraph, 82
 Securing cooperation of subordinates, 297
 Securing sales by watching fixed cost absorption, 173
 Selection of salesmen, 245
 Sellers, case of, in planning, 302
 Selling capacity losses, 166
 Sequence, law of dependent as applied to sales, 240
 Service at a profit, 3
 Service charge as profit, 4
 Shibley, Fred W., 11, 62, 79, 106, 112, 253
 Ship controls, 161
 Sinclair, John F., 35
 Sloan, Alfred P. Jr., 55, 65, 71, 260
 Sloan, Laurence H., 28
 Source and cause of business, man as, 280

INDEX

- Sources of profit and loss, neglect to study, 21
- Specifications covering head of betterment staff, 263
- Staff, covering betterment work, functions of, 262
and line, coordinating, 263
organizing for, 288
- Staff organization, as counsel and coordination, 257
covering waste elimination, 155
in human development, 287
- Standard costs, mathematics to determine at normal capacity, 228
total, 228
unit, 229
- Standardized operation costs, 138
- Starting financial analysis, suggestions in, 192
- Statistical work covering sales, 176
- Study of unit costs, 141
- Subordinates, securing cooperation of, 297
- Suggested sequence in financial analysis, 189
- Suggestions in starting financial analysis, 192
- Super-control, 12
- Super-controller, 278
- Supervisors and workers, relation to profits, 149
- Surplus, 41
- Surplus profit, conversion to operating profit, 77
to net worth, rate of, 69
sales to meet, theorem XVIII, 225
- Surplus Retention Point, sales to meet, theorem XVII, 224
- Surveying the market, 238
- Symbols, key to mathematical, 212
- Synchronizing money and men, 263
- System of sales control by points, 248
- Theorem I, to determine profitless point in dollars, 214
- II, to determine profitless point in per cent, 214
- III, to determine normal capacity profitless point, 215
- IV, profitless point in per cent, normal capacity basis, 215
- V, maximum net sales necessary, 216
- VI, profit in dollars, 217
- VII, profit in per cent, 217
- VIII, maximum fixed outgo, 218
- IX, required profitless point, 219
- X, allowable fixed outgo, 219
- XI, necessary net sales, 220
- XII, allowable maximum fixed outgo, 220
- XIII, allowable variable outgo, 221
- XIV, sales to meet Crisis Point, 222
- XV, sales to meet Danger Point, 223
- XVI, sales to meet Unhealthy Point, 223
- XVII, sales to meet Surplus Retention Point, 224
- XVIII, sales to meet Surplus Profit, 225
- XIX, sales to meet Deadline, 225
- XX, Business Profit necessary, 225
- Thirteen period calendar, 207
- Three kinds of costs, 85
- Total standard costs, 228
- Trained management as career, 295
- Transferring fixed to variable costs, 156
- Treasurer's functions, 276
- Turnover, 153
and capital employed, 71, 129, 185
- Turnover law, 72
- Turnovergraph as graphic variable balance sheet, 187
- Twofold evolution of business, 12
- Two ways of profit making, 112

U

- Uncontrollables, control of, 147
- Unhealthy Point, 94
sales necessary to meet, theorem XVI, 223

T

- Tangible net worth, 191
- The Business Week*, 302
- The Saturday Evening Post*, 295

PROFIT ENGINEERING

Unit costs, a study of, 141
Unit standard costs, 229
Unitary analysis, 95
Unitary profit formula, 76
"Unorganization" in industry, reasons for, 253
Unscientific approach in determining sales par, 126
Uses to which graphics are put, 47

V

Variable balance sheet, of graphic nature and known as Turnover-graph, 187
Variable budget, developing, 143
as final picture, 145
Variable budget record, 144
Variable budgeting, 91, 97, 99, 107, 121, 139, 143, 167
100 per cent capacity as base in, 139
Variable costs, determining allowable, 133
Variable income statement, as Profit-graph, 82
Variable outgo allowable, theorem XIII, 221
Variation accounting, 163

Variations from sales and profit course, 167
Vital statistics on Profitgraph, 94

W

"Wages" of capital in form of profit, 8
Wallace, Sir Johnstone, 9
Waller, A. E., 159
Wall Street Journal, 36
"Waste in Industry," report Hoover Committee, 194, 280
Waste elimination, 154, 284
staff organization covering, 155
Wellington, C. Oliver, 206
Wilson, S. L., 131
Work of controller's department, 275
Workers and supervisors, relation to profits, 149
Worsham, James A., 231

Y

Yardstick covering owner's profit, 67
Yearly projection of actual results, 143
Yearly versus cyclical swings, 200
Young, Owen D., 1, 11, 27

UNIVERSAL
LIBRARY



138 481

UNIVERSAL
LIBRARY